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FROM
B. P. JOHNSON,
SECRETARY
N. Y. STATE
Agricultural Society,
ALBANY, N. Y.

TRANSACTIONS

OF THE

New York State Agricultural Society,

WITH AN

ABSTRACT OF THE PROCEEDINGS

OF THE

COUNTY AGRICULTURAL SOCIETIES.

VOLUME XXII.—1862.

ALBANY:
COMSTOCK & CASSIDY, PRINTERS.
1863.

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NOTICE.

In presenting to the farmers of New York the twenty-second volume of the Transactions of the Society, we are enabled to congratulate them that, notwithstanding the unsettled state of our country, the agricultural progress of New York has been in the highest degree encouraging. Although our State has sent to the field of contest, from our rural population, a large portion of those called into service, still the farmers have, by economy and vigilance, carried forward the operations of the farm so that the returns throughout our State have, upon the whole, exceeded our expectations.

Among the many valuable papers to be found in this volume, we would direct attention to the address of President Cornell, at the close of his term of service, as worthy of careful examination. The subject of fencing, and the propriety of reducing the fences on our farms, is fully discussed. The advantage of thorough-bred stock to improve the native stock, is urged with great force upon our farmers. A brief summary is given of what the State has done for agriculture, and what in return agriculture under our associations has done for the State, adding largely to our wealth. The call for this address has been unusually large, and it has been widely distributed in pamphlet form, and will be productive of much good.

The survey of the county of Orange, by Hon. Goldsmith Denniston, will be found to be a work of very great interest. This is the first survey made of the river counties, and the history, progress and present state of agriculture is given with great particularity, and shows the great advance which the sterling farmers of that county have made. Mr. Denniston was a native of that county, and lived there until a few years since, and had facilities for his work which he has improved to the greatest advantage. He deserves the thanks of the Society for his valuable work, which will be productive of good to our State for all time to come.

Cheese, Associated Dairies, by X. A. Willard, who furnished a dairy article for the last volume, which has been extensively circulated. This article was called for by the numerous establishments springing up in different parts of the State, and Mr. W. has given faithfully the history, progress and present prospects of cheese factories, which will answer the various inquiries which are made. All the details of structures, and the management of the cheese are so fully given that no one need mistake how to manufacture good cheese.

We give a valuable article on the cultivation of wheat, by Professors Lawes and Gilbert, giving experiments for a succession of

years, confirming the investigations of these gentlemen heretofore published in our preceding volumes. Also an article on farm yard manure, by Prof. Lawes, which is just the thing needed. A very valuable article on insects destructive to crops, by F. De Tschudi, of Switzerland, and of birds useful in their destruction, we commend to the special attention of our readers.

An article on *Flemish manure* (night soil) is given, followed by discussions on *town sewage*, which should receive careful consideration from all cultivators of the soil, especially those in the neighborhood of our large towns.

Dr. Fitch, the entomologist of the Society, furnishes the eighth report on insects, which will be found of equal importance to those which have been given in previous volumes.

Essays on the culture and management of tobacco and hemp, by L. J. Bradford, Esq., of Kentucky, will meet the wants of those who are commencing their culture.

A report on the International Exhibition of Industry and Art, held in London in 1862, is given. This report has been prepared in the midst of other labors which were sufficient for all our time, and although there is not claimed for it any special attention, yet, as due to the exhibitors from this country, it is hoped it will meet with approbation. An endeavor has been made to give in this report a fair description of the articles from this country, and of the general features of the exhibition, the most extensive ever held.

We had expected a very interesting report to the Society of the great Battersea Agricultural Exhibition, in London, from ex-President Cornell. Mr. Cornell had commenced the report and had furnished us the copy, including nearly all of the stock department, when he was taken ill and has been unable to resume his pen. The report will be completed for the next volume of the Transactions. I had intended to have combined with Mr. Cornell's my own report on that unequaled agricultural exhibition, but will let that also follow Mr. Cornell's to another year.

The statistics which were commenced under the law of 1862 have not been fully taken. As far as received they have been given, and it is hoped arrangements will be made in time for the collection of the statistics of 1863.

In closing up the labors of another year we tender our thanks to the farmers of our State for their cordial coöperation in the great work of agricultural improvement. We congratulate them for what has been done, and we trust by renewed energy and perseverance they will go on improving until our agriculture shall be equal to that of any other portion of the world.

B. P. JOHNSON.

Agricultural Rooms, *April*, 1863.

CONSTITUTION

OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

The style of this Society shall be "The New York State Agricultural Society." Its objects shall be to improve the condition of Agriculture, Horticulture and the Household Arts.

SEC. 1. The Society shall consist of such citizens of the State as shall signify, in writing, their wish to become members, and shall pay on subscribing not less than one dollar, and annually thereafter one dollar, and also of Honorary and Corresponding members.

The Presidents of County Agricultural Societies, or a delegate from each, shall ex-officio be members of this Society.

The payment of ten dollars or more shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the Society shall consist of a President, eight Vice-Presidents, one to be located in each Judicial District; a Recording Secretary, a Corresponding Secretary, a Treasurer, an Executive Committee, to consist of the officers above named, and five additional members, of the ex-Presidents shall be ex-officio members of the Executive Committee, and these five shall consist of the five ex-Presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the ex-Presidents of the Society, not members of the Executive Committee, shall constitute a Board of Counselors, to which may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the Society may in any manner be interested; and a General Committee, the members of which shall be located in the several counties, and be equal to the representatives in the House of Assembly.

SEC. 3. The Recording Secretary shall keep the minutes of the Society. The Corresponding Secretary shall carry on the correspondence with other Societies, with individuals and with the General Committee, in the furtherance of the objects of the Society.

The Treasurer shall keep the funds of the Society, and disburse them on the order of the President or a Vice-President, countersigned by the Recording Secretary, and shall make a report of the receipts and expenditures at the annual meeting in February.

The Executive Committee shall take charge of and distribute or preserve all seeds, plants, books, models, &c., which may be trans-

mitted to the Society; and shall have also the charge of all communications designed or calculated for publication, and, so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the Society.

The General Committee are charged with the interests of the Society in the counties in which they shall respectively reside, and will constitute a medium of communication between the Executive Committee and the remote members of the Society.

SEC. 4. There shall be an annual meeting of the Society on the second Wednesday of February, in the city of Albany, at which time all the officers shall be elected by a plurality of votes and by ballot, with the exception of the General Committee for the counties, which may be appointed by the Executive Committee, who shall have power to fill any vacancies which may occur in the offices of the Society during the year. Extra meetings may be convoked by the Executive Committee. Fifteen members shall be a quorum for the transaction of business.

SEC. 5. The Society shall hold an Annual Cattle Show and Fair at such time and place as shall be designated by the Executive Committee.

SEC. 6. The Constitution may be amended by a vote of two-thirds of the members attending any annual meeting, upon one year's previous notice in writing.

STATE AGRICULTURAL ROOMS,
February, 1863.

I certify the above to be a true copy of the Constitution of the New York State Agricultural Society.

B. P. JOHNSON, *Cor. Secretary.*

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Monthly meeting of the Executive Committee, first Thursday in each month.

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Wende, B. A., Alden.
Wood, Oren S., Montreal.
Winne, Jurian, Bethlehem.

Y.

Yelverton, Robert, New York.

CONTENTS, VOL. XXII.

Page.

Introduction iii
Constitution v
Officers vii
Life Members viii

ILLUSTRATIONS.

Section flax plant 53
Fibers of flax, hemp, cotton, wool, &c.... 54
Jefferson's mold board 68
Hurdle fence 116
Two maps Orange county—face 136
Diagram Orange county 136
Geological illustrations, Orange county .. 155
158
do do 160, 161
Washington's headquarters, Newburgh .. 206
Farm houses 206, 207
Ralph's cheese vat 246
Tobacco fork 329
Insects 665, 670

A.

Annual report 3
Agricultural statistics 697, 6
Annual fair, Rochester 7
Annual meeting 13
Address—E. Cornell, Pres't 19
H. S. Randall, LL. D., Cortland county 342
Judge Suffern, Rockland 385
G. W. Smith, Farmers' Club, Little Falls 429
Agricultural discussions at State Fair, 30, 498
Additions to Library 692
Agricultural college 11
Appropriations to Agricultural societies .. 22
Allegany county report 332
Afton town society report 409
Adirondack grape 494
Annual fair 496
card from Executive Com 497
Allen's horizontal engine, London exhib'n 537
Andrews, W. D., prem., London exhib'n 539
American lady's visit to do 546 to 560
American agricultural machines, London exhibition 560
Agricultural implements and machinery, their influence 566
Asparagus beetle 659
Additions to library 644

B.

Borers in honey locust 117
Bacon, Wm., Transactions 1861 119
Birds useful for destroying insects ... 306–317
Bradford, L. J., tobacco and hemp ... 324–326
Broome county report 332

Page.

Benton agricultural society report 410
Brockport Society report 451
Bee culture 351
Butter statements 350
Bachellor & Sons, premium, London ex .. 541
Bates, Robert, stammering cured, do .. 575
Beet root sugar 613

C.

County and town associations 5, 331, 409
Cornell, E., address 19
Capital invested in agricultural pursuits, 21
Correspondence 95
B. P. Johnson's letters from London, 95 to 115
E. Cornell, letter on England 115
Wm. Bacon, Berkshire county, Mass., and Trans. 118, 119
Editor Mark Lane Express, Trans. 1861 120
Cheese associated dairies, X. A. Willard, 236
factories in operation 237
advantages factory system 239
objections to do 241
organization and site 243
the buildings 244
the apparatus 245
vat and presses 246, 247
hoops and milk can 248
table, rack and sink 249
cheese, and cost making 260
milk, and treatment 251
process manufacture 252
cheese per gallon milk 254
acidity of milk for fine cheese 255
Cayuga county report 332
Cattaraugus county report 333
improvements in agriculture 334
Chautauqua county report 334
Chenango county report 335
Clinton county report 336
Columbia county report 336
Cortland county report 338
dedication buildings 339
address, H. S. Randall, LL. D. 341
history of society 343
Constantia town society report 410
Clay Farmers' Club 455
Colvin & Goddard, premium, London ex .. 539
Conroy, E., premium, London exhibition, 539
Coe, O., premium, do 541
Cow milker, premium, do 565
Cropsey's painting, do 681

D.

Draining, discussion ..... 39 to 43
remarks Geo. Geddes 39

Page.
remarks T.C. Peters 41
H. T. E. Foster, E. G. Faile, H. T. Brooks 42
J. J. Thomas, S. Robinson, 43
Denniston, Goldsmith, Orange, survey... 135 to 213
Delaware county report 346
Dutchess county report 347
Dryden town report 410
Delhi society report 455
Dundee society report 455
Dane, J. F. & Co., premium on plows, London exhibition 541

E.

Executive Committee 1863 18
Essex county report 348
Evans' rotary digger 490
Emery Brothers' cotton gin, London ex... 542
Educational works, do 579

F.

Fergusson, A., death of 9
Flax machine, resolutions and report, 17–48
Fences, their cost 23
Fitch, Dr., insects—grain aphis 32, 33
wheat midge 36
borer in honey locust, 117
Fences and cattle laws N. Y. 45
T. C. Peters, expense fences 45
L. F. Allen, E. Cornell, S. Robinson, 46 47
Fine arts, London exhibition 581
Fitch's eighth report on insects 657
insects infesting gardens 659
asparagus beetle 659

G.

Geddes, George, draining 39
Genesee county report 349
Greene county report 349
Galen town society report 410
Granville, Earl, letter to B. P. Johnson, 506
Gore, J. C., premium, London ex. 540

H.

Hamel, Dr., death of 11
Hampshire Down sheep 59
Horse breeding, H. L. Shields 89
Hemp culture, Bradford 326
Herkimer county report 349
Hansbrow, T., premium, London ex. 541
Hops, London exhibition 610

I.

Insects—grain aphis, wheat midge 32
locust tree borer, Dr. Fitch 88
Insects destructive, F. de Tschudi 307
birds useful in destroying insects 307
Insects, Dr. Fitch's eighth report 657
Insects infesting gardens: 659
Asparagus Beetle 659
a European insect newly introduced here 659
no insects on our asparagus before... 660
asparagus extensively cultivated on Long Island 661
first appearance of this beetle..... 662
its destructiveness 662

Page.
the asparagus fully naturalized on Long Island 663
winter quarters of the insect 664
it comes out in May 664
the larva 665
its habits 665
the pupa and its cocoon 666
the beetle 666
its habits 666
remedies 667
hand-picking 667
skunks 667
fowls 667
Garden Flea 668
most abundant, but hitherto unnoticed 668
its name 669
its appearance and motions 669
its body 669
its forked tail and skipping apparatus 670
head and antennæ 670
colors 671
varieties 671
in grain fields and on clover 671
genus 671
its food and combats 672
how it injures the leaves 672
Field Flea 673
described 673
singular combat 673
other species 674
color 674
Modern Vaporer Moth 675
differs from the European species 675
its caterpillar 676
young caterpillar 676
its cocoons 677
chrysalis 677
male moth 678
female moth 678
eggs 679
a parasite destroys the eggs 679
the parasite's operations 680
remedies 680
Hair-necked Rose-bug 681
its localities 682
the species erroneously named 683
Appendix: 685
Historical notice of the first appearance of the Hessian fly in this country 685
The Earth-worm 686
is not the larva of an insect 687
feeds on earthy matter 687
draws dead leaves into its holes 688
its under-ground burrows 689
it eats green leaves also 689
is a pest in gardens 690
remedies to repel these worms 690
a forked earth-worm 691
Ithaca Farmers' Club 412
International Exhibition, London 503
report, B. P. Johnson 503
official directory 503
commissioners 504, 505
letter, Earl Granville, and answer, B. P. Johnson 506
introduction to report 507
origin exhibition 509
advance over exhibition 1851 511
the building of 1862 512
opening exhibition 513
instructions to jurors 514
jurors from U. States 516
presentation of awards 518, 527
exhibitors U. States 527
substances used for food 528

Page.

U. S. carriages 530
sewing machines 531
Howes', Wheeler & Wilson's 532
Wilcox & Gibbs', Singer's 534
Smith's tapestry loom 535
machinery in general 536
Allen's engine, and U. S. machinery. 537
Porter's governor, &c 538
machinery in U. S. court 542
from London Times 545
American lady's visit to exhibition .. 546
agricult'l and horticultural machines, 560
steam plows 560
reaping machines 562
McCormick's 562
Wood's 564
Russell & Tremain's 564
Kirby's 564
cow milker 565
agricultural implements, their influence 566
steam plows, trial ..... 567 to 572
civil and military engineering 573
naval architecture 573
photographs 574
musical instruments 574
Steinway & Hulskamp's 575
flax and hemp, &c. 576, 577
paper and stationery 578
educational works 579
furniture, &c. 580, 581
fine arts 581
list U. S. awards 583
British colonies, &c 586
Africa 589
appendix 590
mining and minerals 590
coal and iron 600
cereals 607
beet root sugar 613
railway plant 617
American carriages 622
machinery 625
military engineering and ordnance ... 631
Armstrong guns 634
naval architecture 640
surgical instruments 643
cotton 645
flax and hemp 646
silk 648
woolen goods, dyes, &c. 650
shoddy 652
printing 653

J.

Johnson, B. P., exhibition in London, 47, 503 507
do letters from England, 95–115
do report on exhibition 503
Jefferson county report 349
awards 350, 351
Jefferson town society report 412
Jefferson, President, plow 67

K.

Kirby's reaper and mower, London ex. .. 564

L.

Lawes and Gilbert, experiments on wheat, 258 271
Lawes, J. B., farm-yard manure 271

Page.

Lewis county report 352
Little Falls Farmers' Club 413
object of club 413
advance of agriculture 414
soil and meteorological changes 414
fruit, grass, cheese, &c. 415, 416
wheat crop 1862, and corn 419, 420
vegetables, grapes, plums 424–426
address by G. W. Smith 429
Lodi town society report 443
Lee & Larned, fire engine, London ex.... 534

M.

Morrill, Hon. J., on distribution public lands 122
Manures, farm yard, Lawes 271
Manures, Flemish (night soil) 274
Manures (town sewage) 280
alderman Mechi's remarks 280, 297
Mr. Edmonds, Prof. Voelker & others, 298 304
Madison county report 353
Monroe county report 353
Middleburgh town society report 444
Moravia town society report 446
Moriah town society report 447
Manlius and Pompey town society report, 450
Milch cows, premium 465
McCormick's reaper, London exhibition .. 562
Morton, Prof. J. C., report on steam plow 567

N.

Niagara county report 353
Near, Charles, premium, London ex. 539

O.

Officers Society, 1863 15
Orange county survey, G. Denniston 135
Part 1, early history and settlement, 137
2, source of title to land 151
3, geology, soils 153
4, physiology of county 166
5, political divisions and popul'n 177
6, climate and products 185
7, farm houses and buildings ... 204
8, statistics 213
Orange county report 357
condition of agriculture 359
dairying and domestic animals 359
field crops, fruits and statistics 361
Oneida county report 354
Ontario county report 355
field crops 356
proceedsugs agricultural soc'y in 1820, 356
draining 357
Orleans county report 361
statement crops 363
Oswego county report 364
Otsego county report 364
statistics, suggestions as to collecting, 366
Onions, culture of, D. K. Youngs 373
Otisco Farmers' Club, report 447
Orwell and Boylston, report 450

P.

Pratt, Col. G. W., death of 9
Pratt, Zadock, dairy farm 63
Plow, President Jefferson's, by H. S. Randall, LL. D 67

Page.
Pears, culture of..... 352
Palmyra society report 457
Premiums State Fair and Annual Meeting 462 to 501
Porter, T. C., engine governor, London exhibition 537, 538
Pattee, paper bags, London ex..... 539

Q.

Queens county report..... 366
field crops, premium 368
asparagus beetle 370
culture onions..... 373
historical notices county, 1644 to 1844, 378

R.

Reid, William, death of 10
Rabies in sheep, Hon. Henry S. Randall, LL. D..... 74
Randall, H. S., LL. D., Jefferson's plow, 67
Rensselaer county report 385
Rockland county report..... 385
address, Judge Suffern 385
Rosendale Farmers' Club 447
Ross, John, premium, London ex..... 541
Russell & Tremain's reaper, London ex.. 564

S.

Soiling cattle 25
South Down and Hampshire Down sheep, 59
Sheep, Merino, Chancellor Livingston's letter 65
Shields, H. L., breeding horses 89
St. Lawrence county report..... 387
address by Joseph Harris 388
Saratoga county report 389
death of S. Bacheller, late pres't.... 390
statistics, notice of..... 390
address by A. Bockes..... 391
tax on dogs..... 392
Schoharie county report 394
Stock Growers' Association..... 395
Schuyler county report 395
Seneca county report 396
premium on grain and roots..... 397
Steuben county report 397
weather and crops..... 398
Sullivan county, C. Hatch, suggestions for improvement agriculture..... 400
state of agriculture..... 401, 402
Skaneateles Farmers' Club..... 448
Sheep show, Thorne Hill 450
Seneca Falls town report..... 458
Smith air light for locomotives 489
Secretary of Society, testimonial from the clerks 499
Sewing machines at London exhibition... 532
Smith, Alexander, tapestry loom..... 535
Sanborn, G. H., prem., London ex.. 538, 540
Sickels, F. E., premium, London ex..... 541

Page.
Steinway's prize pianos, London ex..... 575
Surgical instruments, London ex 575
Sugar beet root 613
Statistics 697
circular 699
act..... 700
form of blanks 702
importance of procuring statistics.... 703
suggestions as to collecting 703
defective returns..... 704
tables..... 705 to 709
number of sheep killed by dogs..... 710
number acres wheat put in..... 710
Cayuga and Steuben returns .. 710 to 712

T.

Taintor, John A., death of 10
Treasurer's report 13, 461
Thorough-bred male animals recommended 26
Tobacco culture, Bradford 321
Tioga county report 402
Thorne Hill Farmers' Club report, and notice sheep show 450

U.

Underdraining, benefits..... 31
Ulster county report..... 402
statement of agriculture..... 403

V.

Vernon agricultural society report..... 451
agriculture of town..... 452
Van Buren and Lysander report 459
Vienna town report..... 459

W.

Webb, Jonas, death of..... 10
Wheat midge, Dr. Fitch..... 37
Wheat, Mediterranean, early 38
Wool, fine fleeces at fair..... 60
Willard, X. A., cheese dairies 236
Warren county report 404
Washington county report 406
Westchester county report 406
statement field crops..... 407
address, A. B. Conger 407
Wyoming county report..... 408
Wilson town society report..... 453
Winfield union..... 459
Wemple, P. H., premium, London ex.... 538
Worthington, R. H., prem., London ex.. 539
Wood's reaper and mower, London ex.... 564
Ward, W. H., naval signals, prem., London ex..... 573

Y.

Yates county report 408

State of New York.

No. 234.

IN ASSEMBLY,

April 4, 1863.

ANNUAL REPORT

OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

STATE AGRICULTURAL ROOMS,
ALBANY, *April* 4, 1863.

Hon. THEOPHILUS C. CALLICOT,
Speaker of the Assembly:

Pursuant to the acts of the Legislature for the promotion of agriculture, I present the Annual Report of the New York State Agricultural Society, with the proceedings of the Executive Committee, and abstracts of the reports of the county societies.

I am, very respectfully, yours,

B. P. JOHNSON,
Corresponding Secretary.

TRANSACTIONS

OF THE

NEW YORK STATE AGRICULTURAL SOCIETY.

To the Legislature of the State of New York:

The Executive Committee of the New York State Agricultural Society most respectfully report:

The year 1862 has been of unsurpassed interest in the history of our country, and agriculture, as well as the various other interests, has been more or less affected by the terrible conflict which has been in progress and still continues.

In our own State, it is a matter of rejoicing, that, although more than one hundred thousand men have been withdrawn from our fields and workshops, to sustain the free institutions of our country, our farmers have been enabled to carry on their usual operations, and a kind Providence has blessed us with remunerating crops, so that we are enabled to meet the demands which are made upon us.

The increased attention, which necessity has forced upon us, to substitute machinery for hand labor, in order to supply the deficiency of laborers, has enabled the farmers to carry on their operations in a manner that has enabled them in the main to obtain the usual returns from the culture of the soil. Our mechanics have felt the pressure of the times, still, the demands for machinery and implements have been quite as extensive as was anticipated. A rigid economy, which has generally been adopted, will doubtless enable them to meet the demands upon them, and to prepare in season a full supply for the demands of the ensuing season.

Early in the season the question whether, in the existing state of affairs in our country, it was desirable to hold the usual annual exhibition, was discussed. The Executive Committee deemed it best to have the usual exhibition, believing that the farmers and mechanics of the State would not only expect this, but that they would sustain the Society; and the result of the exhibition has most signally shown that this was the only decision that would have met the wishes of the people. The Monroe county Agricultural Society and the citizens of Rochester, with a liberality and energy worthy of the highest praise, entered upon the work of preparing grounds and erections for the Society with a determination that everything necessary to meet the demands of the Society should be provided,

and the testimony of the thousands in attendance at the Annual Fair of their entire success, must have been in the highest degree gratifying. Of the results of the annual exhibition we shall more particulary refer in another part of this report.

It was stated in the report of our predecessors, that "It is highly probable that the result of the present difficulties in our country will cause a change in the agriculture in our State in many respects." It was stated that "Our farmers were already turning their attention to the rearing of sheep, both for wool and mutton;" and it is evident, from the best exhibition of sheep we have ever had at any of our fairs, that in this respect increased attention had been given, and the result it is believed, if judiciously pursued, will be most gratifying. It is hoped, however, that this will be prudently managed, so that there will not be a reaction, which might produce serious losses as in former years. It was also stated, that "The investigations making in relation to flax as a substitute for cotton, was attracting much attention." This also has been realized. The legislature at its last session appropriated $2,000, which was placed in charge of the Society, for the purpose of investigating the improved machinery and process of manufacture, which were claimed to have been made. The Executive Committee appointed a competent committee: Messrs. Samuel Campbell, of New York Mills, Mr. A. Wild, of Albany, J. Stanton Gould, of Hudson. A committee from the Rhode Island Society, Ex-Governor Dyer and Albert Briggs, Esq., attended with them and aided them in their examinations, and favored them with their experience in like investigations in Rhode Island. It is ascertained, as their report will show, that enough has been secured to make flax a very profitable crop to the farmer and to the owners of machinery now in operation; and the market is such as to work up all that is now raised; and the prospect is not without favorable indications, that we may reach the great object in view—flax-cotton a substitute for cotton in the finer fabrics of our country. On the coarser fabrics and with wool it can be used, and is in use profitably now. We hope the Legislature will continue the appropriation, so that the Society can pursue the investigation, if practicable, to a successful conclusion. A little aid now, when these pioneers are struggling for success, would be of more importance to them than a much larger sum when the obstacles now in their way shall be overcome.

The president, Mr. Cornell, was engaged in the preliminary examination of the works, with Mr. Campbell chairman of the committee. The secretary was appointed on the committee, but his engagements prevented his attendance. The Executive Committee are greatly indebted to these gentlemen for their faithful attendance upon the work assigned them, which has been done in a manner most acceptable to the society, and their reward, we trust, will be a successful result in the investigations so auspiciously begun. Their report will be found accompanying this.

Survey of Orange County.

The Executive Board of the Society have for several years desired to have a survey made of some of the river counties. They have been fortunate in securing the services of Hon. Goldsmith Denniston to make the sur-

vey of Orange county. Mr. Denniston made the admirable survey of Steuben county, given in our last volume, which has attracted much attention, not only in our own State but in other portions of our country, notwithstanding the conflicts now raging throughout the country. Judge Denniston was formerly a resident of Orange county, and familiar with the whole county—and has completed his survey; and we are assured it will be among the most interesting and valuable surveys which have been made under the auspices of the Society. The discovery of a lead mine near Port Jervis, is attracting much attention, and preperations are making for working the mine. From the specimens of the ore deposited in the State Agricultural rooms, it promises to be a most valuable discovery for our State and country.

The entomologist, Dr. Fitch, is preparing for our volume a summing up of the insects injurious to vegetation, which have been fully delineated in his reports; and from the experience of the past year we hope to be enabled to resist the depredators which have so long made war upon our crops.

Notwithstanding the calamities of war which are upon us, our county and town associations have in many of the counties come up nobly to their work.

County and Town Associations.

From the reports we are receiving, the exhibitions which have been held have generally been much more successful than was anticipated: and preparations are being made for the ensuing year that will, it is hoped, result in still making further advances in the great work entrusted to their care.

From present appearances there will probably be a large increase in the dairy business in this State, particularly in cheese dairying. Very extensive works are being put up for dairy factories in different parts of the State. The foreign demand for cheese has made a market for all we can spare, and as it is perhaps too common in this country, every new adventure which promises success is so crowded that a reaction takes place which proves disastrous to many.

We need in this State a steadier plan of operations upon the farm, in order to make the pursuit reliably productive. The fertility of the farm cannot ordinarily be kept up without a system of cropping which will enable the farmer to keep up not only, but increase the fertility of his soil. This cannot for any length of time be profitably secured except by a system regularly carried out for a series of years. This does not generally meet the demands of our farmers, who prefer when by the circumstances of the country particular pursuits promise an increased return, to give up the regular system which has been practiced, and the new projects are carried on in many cases at a large expenditure, and for a time it may be profitably, but in the end generally results in impoverishing the land and a loss to the farmer.

We would urge then upon our farmers, while engaging in these investments, to do it so as not to jeopardize all; above all do it so as not to impoverish your farms and thus diminish the capital which you have in a systematic, well conducted farm.

A valuable article on the associated dairies and cheese manufactories is given, and will, it is believed, meet all the inquiries on this subject so important to the dairy interest of our State.

In every department of farm operations improvements can be made, and never was there a more appropriate time for the farmers to adopt the most advisable methods for increasing their crops, by judicious preparation of the soil, by the selection of the choicest seed, and by a wise rotation of crops. In these respects we may learn by the experience of other countries, and the able papers which have been given in our Transactions should receive careful consideration from our farmers.

The fruit crop of our State is becoming a very important aid to the farmer, and we are supplying the principal markets of our country, as well as some of the other countries, with our choice fruits, which amply repay their culture.

The culture of *sorghum* has been very successful in the western states, whose climate is milder than ours. It may be cultivated here to some extent, but whether successfully has not yet been determined by any extended operations.

The *sugar beet*, so successful in France and some other of the European nations, could be introduced here, it is believed, to advantage.

It is recommended that efforts be made to determine whether our State can successfully raise these crops, and it is hoped our successors will adopt means to secure this during the coming season.

Agricultural Statistics.

The importance of a systematic plan for obtaining annually the agricultural statistics of our State was suggested. Through the exertions of our President, the Legislature passed an act to collect the agricultural statistics in the various school districts in the State. Blank forms were prepared by the Executive Committee of the Society which were submitted to the Comptroller, who caused them to be printed and distributed as provided by the Legislature.

The blanks were delayed in printing, but as the day of making returns was extended to the first of March it is hoped returns will be generally made. It is probable, from the suggestions we are receiving, that the law may be amended so as to facilitate the taking of the statistics. Of the great importance of this work we can have no doubt whatever. We have had from other states calls for copies of our law, and of the blanks issued, and already the subject of an annual compilation of the statistics of the country through the assessors appointed for collecting the revenue, is before Congress, and should it be adopted the time is not distant when our country will be furnished with a better system than any country on the globe. In this connection the county committees appointed by the Executive Committee will have work in which they can do much good, and it is suggested that hereafter special instructions be given them to attend to this work. Some of them have already interested themselves in this, and we are assured that their best energies will be devoted to this work.

The Fair at Rochester, 1862.

The Annual Fair was held in the commodious grounds of the Monroe County Agricultural Society, immediately adjoining the city of Rochester, on the 30th September, and 1st, 2d and 3d of October, and it is gratifying to recognize the complete arrangement of these grounds, in all their important fixtures, as prepared for any future exhibitions of the Society at a very small expense.

As the volume of the Transactions of the Society form the record history of the Society, it is important to state that this was one of the most successful fairs ever held by the Society, perhaps the most successful. It is in the first place due to the life and energy of the American people, who could rise above all obstacles to give success to an object to which they had devoted their energies; and in the second place it is eminently due to that intelligence of the value of agricultural science now so extensively disseminated among our people. At no former fair have so many things combined to work out an adverse result.

The war with all its gloom, its sacrifices, its hour of mourning in so many families, its vast outlay of treasures, its exhausting cares, its claim to the every thought of the people, all this was in full force—never, never in our history more so—no, not in the very Revolution greater; and then the necessity for the strictest economy in the use of money, since the people were giving as never people gave before; and to make the shadows which seemed to hang over the Fair of 1862 the deeper yet, a week of worse weather the Society never encountered. The preliminary day was gloomy, thus preventing many plans for coming from a distance, and rain in more or less quantity fell on every day of the Fair, and yet it *was a great success.* It was so in its highest feature, that which is the object of the Society's existence—the progress of improvement. It was so in its vast attendance of people, coming as they did by the ten thousands, and it was reasonably so in its pecuniary results, (being fifth in amount of receipts out of twenty-two Fairs held by the Society). If the skies had been in the brilliancy which is so often in our climate the peculiar dress of October, it is believed by the best judging friends of the Society, that in numbers and receipts the Fair of 1862 might have been peer to any one that had preceded it.

Its location was admirable, for it found its home in the center of Western New York, and while the Society believes that in any and every part of New York the Fair of the Society would be welcome, it was conceded for the events of this year the location was most fortunate. Agriculture in the State of New York is a science of constant progression. It has gone from one degree of excellence to a higher, and in this progress the revolution of the science has been accomplished; it is now the science of the many where it once was the contemned knowledge of the few.

The interest shown at the agricultural discussions which were held during the evenings of the Fair, have now become one of their features. Those discussions, intelligently presided over by the *Hon. A. B. Conger*, an ex-President of the Society, were welcomed. The debates were animated, terse, uttering strong truths, displaying both sides. The propositions did

not receive tame affirmatives, but were wrought out to conclusions by real mental work.

Machinery showed the results of the unwearied inventions of our countrymen. Having proved to the farmer that iron and steel are his best servants, and this truth having been accepted by the many, the inventor goes on and never fails to succeed bringing on the farm the machine that takes the seed from the bag, the harvest to the granary. Whoever examined closely the display of machinery on the ground saw this most welcome truth of progress made a solid fact.

While all the cereals had in this fair their triumphs, there were superb results of the dairy; a business which was in a mediocrity of home use a few years since is now in such power as to push its product into the markets of England, and rival Stilton and Gloucester. Its excellence is in keeping, that sees the value of having the best material, and the crowd who visited dairy hall could appreciate what are the capacities even of high and cold lands for use and profit, tended by the hand of industry.

The animal department was pronounced by the judges as excellent, especially the sheep department. The choice old stock brought into the country years since by men high in rank and character, were here represented by superb animals, and the prophecies made by such a man as Chancellor Livingston of the judgment of the people in relation to the use and profit of the best grades received in the display of this fair, just fulfillment.

Fruit and flowers, the cause of so much pleasure to the friends of the farmer, were splendidly illustrated, as, indeed, in the vicinity of the nurseries of Rochester they must have been. So testified thousands who crowded floral hall, so admirably arranged by the superintendent of that department.

Nor was domestic hall less crowded in the exhibition of needle work, and of so many objects of skill and taste which the great multitude who thronged this hall found ample reward.

While the severe duties of the Capitol and the war made absence from the seat of government by the Chief Magistrate of the State almost impossible, they were represented by the Secretary of State and the Attorney General, and senators and members of Assembly, who were cheered by seeing what beneficial results had arisen by the wise kindness shown by the State to the Society.

Canada sent some of its distinguished gentlemen as delegates from the Provincial Society, who gave a very intelligent examination to the Fair. Many of the citizens were exhibitors, and added largely to the interest of the exhibition by their choice and valuable stock, which, in competition with ours, shows their great value by the awards of the judges. Several gentlemen, as in years past, aided the society by their counsels as judges in the most important departments of the Fair.

Systematized in all its operations, the management of the Fair was such as to give to the great assemblage of people every facility for the examination of every portion of the exhibition. The superintendents fully understood their duties, and though these duties were of the most perplexing character, requiring patience to answer thousands of inquiries, and an almost universal knowledge; yet, the order and method with which their

duties were discharged, the people were satisfied, and these valuable officers were satisfied that they had so well met and anticipated even the wishes of the people.

The President and Secretary of the Society, on their return from their visit to the old word, received during the fair the most cordial welcome from their associates and the friends of the Society, and their congratulations upon their safe return from their interesting visit to London, where they had represented the Society.

And the fair of 1862 closed with the full appreciation by the Society of the labors of the gentlemen of Rochester with the memories of the highest success. With renewed hopes for the future, and with the determination that thus sustained in war as in peace, in shadow as in sunshine, the Society will go onward and forward.

It is due to the people of Rochester and the west, in closing this report, to say, that a fair has never been held by the Society, where everything connected with it has been carried forward more to the satisfaction of the Society than the one of 1862; and we indulge the hope that hereafter an opportunity may be given the Society to meet again upon the same field, when brighter skies may give the farmers and mechanics of the west a better opportunity of showing what can be done for the advancement of the great agricultural interests of our State.

It becomes our painful duty to announce the deaths of several distinguished gentlemen connected with agriculture, during the past year. Several of these gentlemen had been associates with us, and their loss will be most severely felt.

The Hon. Adam Fergusson, of Canada.

This distinguished agriculturist died at Woodhill, Canada West, the last of September, in the 79th year of his age. He was well known in this State, having for many years, until his declining health forbade it, attended the Annual Fairs of our Society, in which he took a very deep interest. He was a native of Scotland; came to Canada in 1831, and became an extensive and successful farmer, and the most extensive breeder of Short Horn cattle in Canada. He held many offices of public trust, and was one of the founders of the Agricultural Association of Upper Canada. He was one of the oldest corresponding and honorary members of our Society, and no man was more honored and esteemed among the distinguished men who have been elected to a like position. His death took place during the Annual Exhibition of the Canada Society, in September last; and appropriate resolutions were passed by the Society. He was a good and just man, and his last end was peace.

Col. George W. Pratt, of the New York Volunteers.

The death of Col. Pratt has brought sorrow into many a family circle. He was one of the most promising young men of our State. He was a gentlemen of rare acquirements, an ardent friend and supporter of agriculture, as well as of literary and scientific institutions. He died with his harness on, as a soldier and patriot would wish to die. May his death be sanctified to his afflicted relatives, and to our State and country.

William Reid, of Elizabeth, N. J.,

One of the leading horticulturists and nurserymen of our country. We saw Mr. Reid at the Pomological Convention, at Boston, on our return from Europe, in September. He was one of the most active members of the convention, and little did his associates anticipate that he would so soon be called to another world. He was a man of rare talents for his work; a decided Christian, and while his family and friends mourn his loss, we trust he is reaping, in a better world, the fruits of a well spent life consecrated to service of his Redeemer.

John A. Taintor, of Hartford.

The sudden death of this gentleman was announced a short time since. Mr. Taintor has been actively engaged for many years in the importation of fine stock from Europe, and has done much to advance the agricultural interests of our country. We had correspondence with him for several years, and have often met him, and esteemed him as a most companionable and gentlemanly man. His loss will be severely felt in the circle in which he moved. It is said that the week previous to his death he apprehended that he should not long survive, and visited the cemetery with a member of his family, selected and gave directions as to the place of his burial, and made sundry gifts and disposals of his personal property. How often are we called to mourn the loss of those who, to all human view, were calculated to do great good in the world. But He who doeth all things well, knows the best time to call us home.

The late Mr. Jonas Webb.

The death was lately announced, at the comparatively early age of sixty-six, of Mr. Jonas Webb, late of Babraham, Cambridgeshire, England, whose fame as a South Down breeder caused his name to be honorably known throughout the world. Mr. Webb survived his wife only four days, and his death, which is attributed to gastric fever, was probably accelerated by the anguish sustained by the loss of the beloved partner with whom he had so successfully fought the battle of life. Mr. Webb's ramlettings may be said to have succeeded the Holkham sheep shearings which early in the century conferred such lustre on the name of Coke, and their annual recurrence was an epoch in the agricultural year. Around his sale ring, in one of the Babraham meadows, were regularly gathered gentlemen interested in sheep breeding, not merely in the east of England, but from the west, north and south also, to say nothing of strangers from France, Germany, Spain, Sweden, and every European country, with enterprising "corn stalks" from Australia, and cute Yankees from the New World. Commenced thirty-four years since, these meetings enjoyed an unprecedented prosperity, as the notices which appeared of them in the *Times* periodically showed, until they were brought to a regretted termination last June, when advancing years and an honorable competence induced Mr. Webb to retire from the active scene which he had so long occupied and adorned. The last sale was a perfect triumph for him. The flock scattered literally to the four winds of heaven, for some crossed the

Atlantic, others went to Australia, and others to every State in the Old World, realized altogether the splendid sum of £16,000, and the cheers with which their former possessor was greeted at the close were the best proof that no one envied him his fairly achieved success. There can be no doubt that Mr. Webb was a public benefactor in the best sense of the word. If he who made two blades of grass to grow where one grew before was pronounced long since a patriot, the man who improved the South Down so that it became at once a more symmetrical, a more mutton producing, and a more wool bearing animal, is also entitled to a niche in the temple of fame.

Death of Dr. Hamel, a Distinguished, Learned and Scientific Russian Gentleman.

We became acquainted with Dr. Hamel in the Great Exhibition in London, in 1851, and found him a gentleman of rare acquirements, and deeply interested in our country. We met him often, and, as far as we were able, answered his numerous inquiries about our country and its institutions, and invited him to visit this country. Dr. Hamel came over to this country in 1853, and was present at the American World's Fair, in which he took a deep interest, and studied carefully our free institutions.

On our arrival in London, in June last, we were called upon by Dr. Hamel, who welcomed us with all the warmth of feeling so characteristic of the man. He desired to be furnished with all the information we could give him of the progress of our country, and urged upon us to go with him to Russia and witness the advances there made, and how much they were indebted to us for the implements and machinery, as well as agricultural works, which proved of great importance to Russia.

Dr. Hamel was in feeble health when we met him in London. Yet he was every day engaged with his note book in hand in taking account of what was most valuable in the exhibition, and which would be useful to his own government. He had been in the service of the Russian government about fifty years. Little did we expect his death so soon when we took him by the hand, for the last time, only a few weeks since. His death will be severely felt in Russia. In everything that could contibute to the welfare of his country he was most ardently devoted. In our present struggle in this country he was deeply interested, and made no disguise of his ardent wish that the rebellion should be soon brought to an end, and our country again united and free, and redeemed from anything that could mar our prosperity as a free people.

Dr. Wm. D. Brinkle, formerly of Philadelphia, died at his residence in New Jersey, December 16th. He was a distinguished Horticulturist, and the Pennsylvania Horticultural Society passed appropriate resolutions, testifying to his great acquirements and valued services to the Society, with which he had been connected for many years.

New York State Agricultural College.

This institution, which has all the requisites for a complete agricultural institution, was in successful operation in 1861, having had two terms under the direction of Gen. M. R. Patrick, President, Dr. Dyer, and

Prof. Kimball. The success of the course of instruction was apparent, and had the times been such as to have continued the institution in progress, its most complete success would, we think, have been demonstrated. Gen. Patrick was called into the service of his country in the hour of its peril, where he is now faithfully discharging his duty in the army of the Potomac. The trustees have suspended the course of studies until quieter times should arrive. The buildings already erected will accommodate 150 students, and when the demand for more shall be made, the building can be enlarged for an equal number in addition. The farm, comprising upwards of 400 acres, will give all the necessary opportunity for instructing the students in all the branches of practical agriculture on the farm. The trustees, we understand, are closing up the pecuniary affairs of the institution, so that when peaceful times arrive, they will be ready to meet the demands for the education of the sons of our farmers and mechanics; and, it is hoped, place the institution in a position to accomplish all that was expected of it. A department of military tactics has been added to the course of instruction, rendered necessary and desirable by the course of events of the past two years.

Appropriation of Lands by Congress.

Congress, at its last session, passed an act in "Aid of instruction in agriculture and the mechanic arts," appropriating public lands. The amount appropriated to the State of New York is 990,000 acres, and when the State Legislature shall accept the same, the appropriation can be made in the manner provided in said act. And it is suggested that application be made to the Legislature for the passage of the law already introduced to accept the lands from the United States, and also for the passage of an act appropriating these lands agreeably to the act of Congress. No immediate revenue may be realized from this land, but it will not be very much delayed; and we may expect that instruction will be offered so as to open the way for all, however limited their means, who may desire instruction.

We trust that this fund, entrusted to the State for the purpose of "*instruction in agriculture and the mechanic arts,*" will not be misapplied or perverted to any other use or purpose whatever.

During the absence of the President and Secretary, the Treasurer of the Society had in charge the correspondence of the Society, and other laborious and important duties, which were discharged in a manner in the highest degree satisfactory; and the members of the executive committee, to whom was assigned the preparation and arrangements for the fair, in connection with the local committee, performed all the duties devolved upon them in a manner most satisfactory to the Society and to the public.

The report of the Treasurer shows the receipts of the Society to have been, during the year, $17,169.02; expenditures, $13,354.96; showing a balance in the treasury of $3,814.06. Of this balance, $2,000 was appropriated by the Legislature to test new machinery and flax cotton, leaving a balance of $1,814.06.

B. P. JOHNSON,
Corresponding Secretary.

ANNUAL MEETING OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

The Annual Meeting of the New York State Agricultural Society took place at the Assembly Chamber, in this city, February 11th. The chair was taken by the President, Hon. Ezra Cornell, at 12 o'clock. The Report of the Treasurer, Luther H. Tucker, was then read, as follows:

RECEIPTS.

Cash on hand per last account		$142 69
Memberships at annual meeting		87 00
Life memberships, during the year		250 00
Annual membership, during the year		1 00
Donation from Hon. Zadock Pratt		50 00
Volumes Transactions sold		18 00
Avails of note discounted May 10		728 58
do do do May 24		730 80
State appropriation, Dr. Fitch, State Entomologist		1,000 00
State appropriation, for State Agricultural Society		840 00
State appropriation, flax machinery premiums		2,000 00
Receipts at Rochester Fair:		
Entries, tickets sold, etc	$10,817 45	
Rent of grounds	375 00	
Life memberships	79 00	
		11,271 45
Hon. E. Cornell, services Arabian horse, 1863		100 00
		$17,169 02

DISBURSEMENTS.

For premiums at winter meeting	$219 73
For premiums, etc., due on account of previous years	534 68
Library and museum expenses	82 75
Salary of Dr. Fitch, State Entomologist	1,000 00
Salaries and traveling expenses	2,823 88
Incidental expenses	101 17
Postage account	126 95
Loan account	1,500 00
Printing and stationery	386 13
Premiums and premium expenses at Rochester Fair	4,486 77
Expenses Rochester Fair	2,002 00
	$13,354 96
Cash on hand, including the still unexpended State Appropriation of $2,000 for premiums on flax machinery	3,814 06
	$17,169 02

The Report of the Executive Committee followed, of which the following summary will call attention to its most important suggestions, from the secretary, B. P. Johnson. Increased attention to machinery has been a marked feature during the past year, and has been of important assistance in enabling us to till our farms while so many have been withdrawn from them for the defence of their country. The wool crop of

the State has attracted increased attention under the stimulus of the lack of cotton and the requirements of the public service. This was illustrated in the exhibition of sheep at the Rochester Fair, which was superior to that of any previous year. Caution, however, is required to prevent the occurrence of undue excitement in a speculative way, leading hereafter to a reaction of such disastrous consequences as the country has once before experienced. Flax culture has also become a matter of great importance, and the efforts to secure new mechanical means of rendering the fiber available for the requirements of the manufacturer, have been the subject of scrutiny on the part of the committee, under an appropriation made by the last Legislature. The reports on this subject, prepared after careful and thorough examination by Messrs. Samuel Campbell, J. Stanton Gould, and A. Wild, show that the desired end, although as yet unattained, is not to be regarded as impracticable, and that its value to the farmers of the State will be very great. An agricultural survey of Orange county has been prepared for the present volume of the Transactions by Hon. G. Denniston, formerly of that county, and now of Steuben. Dr. Asa Fitch is engaged in summing up the results of his investigations as to the injurious insects of the State. The success of the county and town agricultural associations for the year has generally been good, and in many cases exceeded the anticipations entertained. A large increase is probable in the dairy business of the State. Cheese factories are springing up, and the foreign demand is rapidly enlarging. But we need a more definite and systematic plan of operations to insure the continued fertility of our soils, and greater and more certain pecuniary returns; and while engaging in particular investments, it should be done in such a way as not to jeopardize the other interests, and diminish the real capital of the farm. The fruit crop of the State is also becoming one of greater extent. The culture of Sorghum has been successful at the west, but experiments in this State have not, as yet, resulted in such a way as to encourage effort in this direction. The Agricultural Statistics of the State for 1862 are referred to as important to the farmer. The Fair at Rochester is reviewed at length. Obituary notices of friends of agriculture are given. The New York State Agricultural College will be ready to resume operations as soon as more favorable times arrive; and the lands donated for the encouragement of education in agriculture and the mechanic arts by the last Congress, should be accepted by the State as a trust for the benefit of this institution.

After the acceptance and adoption of the reports as submitted respectively by the treasurer and secretary, Mr. John A. Corey moved the appointment of a committee of three from each Judicial District to nominate officers for the ensuing year, and to recommend a place for the holding of the next Fair. This was agreed to, and the following committee appointed:

1st district, Edward G. Faile, Thos. H. Faile, Solon Robinson; 2d district, Lieut. Gov. D. R. Floyd Jones, Wm. Kelly, A. B. Conger; 3d district, Herman Wendell, J. C. Osgood, John S. Gould; 4th district, John A. Corey, Oscar Granger, D. P. Forest; 5th district, T. S. Faxton, George Geddes, Norman Gowdy; 6th district, A. B. Cornell, C. I. Hayes, F. B. Smith; 7th

district, D. D. T. Moore, H. E. Smith, C. F. Abbott; 8th district, T. C. Peters, L. A. Green, A. Dow.

The committee retired, and after deliberation presented the following nominations, which were accepted, and the gentlemen named duly elected:

President.—Edward G. Faile, of Westchester.

Vice-Presidents.—1. James Boorman Johnston, of New York; 2. Samuel Thorne, Washington Hollow, Dutchess county; 3. Herman Wendell, Albany; 4. Chauncey Boughton, Waterford, Saratoga county; 5. Eli Merriam, Leyden, Lewis county; 6. Clark I. Hayes, Unadilla, Otsego county; 7. B. M. Baker, Rochester; 8. T. C. Peters, Darien, Genesee county.

Corresponding Secretary.—Benjamin P. Johnson, of Albany.

Recording Secretary.—Erastus Corning, Jr. Albany.

Treasurer.—Luther H. Tucker, Albany.

Executive Committee.—James O. Sheldon, Geneva; Samuel Campbell, New York Mills; D. D. T. Moore, Rochester; Joseph McGraw, Jr., Dryden; Oscar Granger, Saratoga Spa.

Utica was recommended as the place of holding the next Fair. The Society then adjourned until evening.

Evening Session.

On convening in the evening, Dr. Asa Fitch, Entomologist of the Society, was introduced by the president, and read a paper embodying the results of his investigations during the past year, principally into the character and habits of the insect which has of late proved so destructive in the asparagus beds of Long Island. This was listened to with close attention.

Hon. Henry S. Randall, of Cortland village, was then presented. His son's flock of sheep having been attacked, the last of December, by a mad dog, and several of them bitten, Mr. R. had availed himself of the oportunity thus affored to watch very carefully the symptoms and progress of rabies in sheep, and proceeded to give a fuller narrative of its various manifestations from day to day, beginning with its first inception and only concluding with the death of the patient, than has ever before been committed to paper by an American observer. There are some discrepancies noted by Mr. Randall, between the cases he so thoroughly examined, and the descriptions of the disease heretofore given by Youatt and other foreign writers; and the paper was an interesting and valuable one, not only for this reason, but from the constant and minute examination involved and the detailed notes which were taken.

Mr. John Stanton Gould, of Hudson, then read the report of the committee, consisting of Samuel Campbell, Esq., of New York Mills, A. Wild, of Cohoes, and himself, who had visited Penn Yann and Lockport to examine the processes now going forward at those two places to produce flax cotton. The report presents a full statement of the ends which it is desired to attain, and the measures of success heretofore accomplished. The action of the Executive Committee on the report is published below; their decision was only reached after a protracted discussion of all the different bearings of the subject, and was finally agreed to unanimously as the only one to which the Society could come in justice to themselves and to the trust reposed in them by the Legislature of the State. It was a matter of no

little regret that the self-denying and public-spirited labors carried on during the past year by Mr. Beach, of Penn Yan, and by the flax company at Lockport, should not have arrived, as yet, at practical results justifying the award to their projectors, of the fund appropriated by the State to test the important experiment in which they are engaged.

Mr. President Cornell then proceeded to read a paper on the results of his observations during the past season, in traveling among the farmers and breeders of Great Britain—a paper containing many useful suggestions, to which we may refer hereafter when it shall appear in print. Mr. Johnson followed in an extemporaneous account of the American Department at the Great Exhibition at London, the reception our contributions met from the commissioners and the public, and the successes they obtained. Mr. Johnson's remarks met with frequent applause; and, in the course of them, he called attention to extracts from the report of the London Times, descriptive of our implements and machinery exhibited. As soon as the awards of the juries were published, and the public became aware that the proportion of prizes and honorable mentions received by American contributors was greater in proportion than that obtained by the representatives of any other country, the location occupied by our inventors was thronged with a constant crowd, and the London papers devoted considerable space to that part of the Exhibition.

The proceedings of the day and evening here terminated, after pleasant and profitable sessions, at which many of the oldest friends and former officers of the Society were present.

SECOND DAY'S PROCEEDINGS.

The exhibition at the Agricultural rooms included the customary show of fruit, among which was an extraordinarily fine collection of winter pears from Ellwanger & Barry, of Rochester, and a good show of apples from Messrs. Slingerland, Sheldon, Price, Carey, Hall and others, and a very limited exhibition of grain, seeds, and dairy products. There were a number of implements also on view, notices of which will be found in the report of the committee given below.

A session for discussion, etc., was also held during the day in the Society's lecture room, Hon. A. B. Conger, of Rockland, in the chair. The attendance was not large. A paper was read on the wines and vineyards of Europe, by Charles A. Lee, M. D., of Peekskill, who had devoted the season of the last vintage mainly to their examination, and the same will be published in the Transactions.

THURSDAY EVENING.

The Society met at the lecture room in the State agricultural hall shortly after seven o'clock, President Cornell in the chair. His Excellency Governor Seymour being present, was invited to a seat on the platform.

The Secretary, Colonel Johnson, then read the reports of committees on articles competing at the exhibition, which will be found with the premiums at the annual fair in their proper place.

The Secretary then read the resolutions passed by the executive committee of the Society during its session that day, with reference to the award of the State appropriation of $2,000 for the encouragement of flax

machinery, and also with reference to the act of Congress appropriating public lands for agricultural education.

RESOLUTIONS FLAX MACHINERY.

The committee appointed to examine flax machinery, and the improvements made in the manufacture of flax, submitted their report. The Lockport flax company, and Mr. Beach, of Penn Yan, were the only applicants whose establishments were entered, and these were examined.

Resolved, That in the judgment of this Society no such advance in the perfection of machinery to test the experiment of manufacturing flax cotton has been made as to warrant the Society in awarding any portion of the sum appropriated by the Legislature at the present time.

Resolved, That the Society will keep the execution of the trust reposed in them by the Legislature for the present in abeyance, under the hope that such valuable improvements may be effected in the coming year, as may justify the Society in awarding the whole or some portion of this amount to any such successful inventions.

Resolved, That the committee be requested to continue their investigations during the year at such time and manner as may, on consultation with the President and Secretary of the Society, be deemed advisable.

Resolved, That the entire sum of two thousand dollars appropriated by the State as aforesaid, now in the hands of the Treasurer of the Society, be deposited by him in one of the trust companies of the city of New York, where it may draw interest until required for the purpose designated by the Legislature.

The report of the committee, and resolutions, were ordered to be presented to the Legislature, and published in the Transactions.

DONATION OF PUBLIC LANDS.

Resolved, That the New York State Agricultural Society are in favor of the passage of a law by the Legislature of this State, accepting the grant of lands made by Congress "in aid of instruction in agriculture and the mechanic arts," and that the Legislature be respectfully requested to accept said grant, by the passage of a law to that effect.

An invitation having been received from the International Agricultural Exhibition to be held in Hamburg, July, 1863, that our Society should be represented at the exhibition, and the invitation having been accepted, it was

Resolved, That the Hon. Ezra Cornell, President of the Society, be appointed a delegate to represent the Society at said exhibition.

PRESIDENT'S ADDRESS.

Mr. Cornell then proceeded to address the Society, having now reached the close of his term of office. His remarks were practical, and will be read with interest by the farmers of the State.

Mr. Cornell closed his address by the introduction of the President elect, Edward G. Faile, Esq., of Westchester, who was received with hearty

applause, and who very briefly pledged his best efforts for the prosperity of interests committed to his charge.

On motion of Mr. Conger,

Resolved, That the thanks of the Society be presented to Hon. Mr. Cornell for his able and instructive address, and that a copy of the same be requested for publication.

MEETING OF NEW BOARD.

FEBRUARY 13.

Present, Edward G. Faile, President; E. Cornell, George Geddes, ex-Presidents; Herman Wendell, B. M. Baker, Eli Merriam, Vice Presidents; D. D. T. Moore, ex-committee; B. P. Johnson, Secretary.

On motion of ex-President Geddes, B. P. Johnson was designated as acting Secretary. Salaries and assistant as last year. Salary of Treasurer the same as last year.

The question of the location of the Fair was postponed until the next meeting of the Board.

One thousand copies of the President's address ordered printed in pamphlet form.

The Secretary was directed to prepare a list of premiums, to be submitted to the Board at its next meeting; and also the usual bond and agreement for the Fair.

The Vice Presidents are desired to furnish the names of suitable persons in their respective districts for county committees, the same number as members of Assembly, in their respective counties.

The members of the Board are also desired to present subjects for essays, to be read before the Society at the next annual meeting.

The meeting adjourned to meet at the call of the President.

B. P. JOHNSON, *Secretary*.

ADDRESS DELIVERED BEFORE THE NEW YORK STATE AGRICULTURAL SOCIETY, AT THE ANNUAL MEETING, ALBANY, FEBRUARY 12, 1863.

BY HON. EZRA CORNELL, PRESIDENT.

Gentlemen of the New York State Agricultural Society:

This meeting marks the close of the past and the commencement of a new year with our Society. The year that has passed has been the most eventful of any in the history of our country—remarkable alike for the devastating ravages of war, in the Southern section of our Union, and the extraordinary prosperity and rich reward of agricultural pursuits in the Northern and Western sections of the same Union. The State of New York, under the blessing of a kind Providence, has never perhaps enjoyed a higher degree of prosperity than during the year that has just closed.

The labors of the husbandman have been rewarded with abundant harvests, and with a ready and satisfactory market for his products; he has also been exempt, in a remarkable degree, from pestilential visitations, from unseasonable and unpropitious weather, and from the ravages of noxious insects.

The heavy drafts upon our farm laborers, caused by the necessities of the government, to meet and suppress a wicked and gigantic rebellion, waged by the slave power for its overthrow, was promptly responded to by volunteers from the free and brave sons of our farmers, who, like Cincinnatus, left the plow in the furrow and rushed to the defence of their country and its free institutions, leaving the work at home to be performed by the reserve corps of the farm, aided by the increased application of the mechanical devices which the inventive talent of our people is annually placing at the disposal of the farmer as a substitute for manual labor. These sources have been ample, all the requirements of agriculture have been supplied, and the condition of the farms of the State, it is believed, was never better at the commencement of a new season than at present for the reception of seeds for the spring crops.

The advantages that have enabled the great agricultural interest of the State to sustain itself so triumphantly, perform all the labors and duties requisite for the growth, gathering and marketing of a crop exceeding the full average of the production of the State, during a season when more than one hundred thousand laborers have been drawn from the tillage of the soil to the destructive pursuits of war, is the result, mainly, of the operations of the New York State Agricultural Society in encouraging every invention and every improvement which tends to lessen manual labor on the farm, and render more efficient such as are indispensable in the pursuits of agriculture.

At the period when the Society was organized, the plow and the harrow

were the only implements in general use upon the farm which had been brought to a tolerable state of efficiency, or that have retained a place among the farm implements of the present day, and these have, since that period, been so improved as to perform better work with a diminished outlay of power. It was then customary to expend from four to six days of manual labor in hoeing an acre of corn. Now, one day, with a horse-hoe, or an improved cultivator, is adequate to the tillage of an acre so perfectly, without the intervention of the hand-hoe, that the average production per acre is fully sustained. The mowing machine, horse rake and horse pitchfork, have so completely robbed the hay field of the terrors of severe labor that the aged and infirm members of the household can supply the necessary demand, and cut as much grass in one day with the machine as ten of the most stalwart men could cut with the scythe in the same time, while the housing of the hay is alike facilitated by the use of the other implements. The reaper is working a like revolution in our fields of grain. Without the use of this machine, thousands of acres of wheat would have remained unharvested during the past summer in the grain growing regions of the West.

And so we might canvass the whole field of farm labor, and we should find a ready helper at hand, in the form of some machine or improved implement, in every department. Even in some of our largest dairies, machinery has taken the place of the milk-maid. In one instance which has come to my knowledge, three persons, with the aid of the "Yankee cow milker," as the machine was termed at the great exhibition in London, perform the milking in a dairy which required the labor of twenty persons before the machine was introduced. The proprietor assured me that the cows were milked more satisfactorily now than formerly, and would remain in milk longer with the use of the machine than they did when the milking was performed by hand.

Much of this improvement and many of these new inventions may be traced to suggestions or encouragements held out by this Society, or to ideas or thoughts which were quickened into active inquiry and directed to inventive channels by visits to our annual fairs, or occasional implement trials. By the opportunity thus afforded for the farmer and the mechanic to meet together annually, where they can cultivate each others acquaintance, examine each others productions, learn each others wants, interchange with each other views as to the defects of this machine and the improvements applicable to that, where dormant ideas are quickened into life by chance suggestions, which result in the invention of a new machine or the improvement of an old one, the State of New York has received benefits, the value of which are as a thousand to one to all the pecuniary aid the Society has drawn from the treasury of the State.

The vast benefits derived from this organization, in the manner above suggested, are by no means the only ones resulting from it. Every branch of production upon the farm is stimulated by it. The farmer sees something at the Fair that he had not seen before. He hears something that is new to him. He revolves the matter over in his mind, as he returns to his own quiet home, and comes to the conclusion that he will try the experi-

ment. The trial is made, it proves a success, and he wonders that he had never thought of it before.

The evening discussions held during our Fairs are important in this point of view, and are very deservedly increasing in popularity. Farmers attending them listen to the discussion of subjects, in which they are directly interested and of which they know much, by practical men like themselves, and it is hardly possible that they should fail to give birth to new ideas, stimulate profitable reflection, and ripen into some improvements.

Our organization, however beneficial it has been to the great farming interests of the State, however valuable it has proved to the manufacturing and mechanical industry of our people, however convenient as a channel through which the science and knowledge of agriculture is collected and disseminated throughout the world, is still far from being perfect—far short of what it should be or what is practicable. The organization of the Society should be so perfected as to secure active representation and co-operation in every county of the State, that every town should feel and recognize the influence of its usefulness, and every school district should know that it was recognized by the State Society as a component part of the great industrial hive of the Empire State, whose interests it was the duty and pleasure of the Society to watch over and promote.

Details for the improvement of our organization would be out of place here, but the subject should occupy the earnest attention of the officers and friends of the Society and of the agriculturists of the State. Our State and county Societies, imperfect as they are, have earned a much higher appreciation than they have yet received by the legislative authorities of the State, representing as they do the most important branch of industry in the State, and by which the millions of our people are fed.

The amount of capital invested in agricultural pursuits and the annual products of the same in the State of New York, as exhibited by the census of 1860, and the increase of the same during the preceeding ten years, are as follows: Cash value of farms, $803,343,393, an increase over the like estimated value in 1850 of $248,796,751. Value of farm implements, $29,166,565, an increase in ten years of $7,081,639. Value of farm stock, such as horses, cattle, sheep, swine, and other animals, $82,293,917, increase in ten years, $2,946,407. Making a total capital invested of $914,803,875, and an aggregate increase in ten years of $258,824,797. Annual products, embracing grain, hay and field crops of all kinds, $67,072,011, an increase over the same class of crops in 1850 of $7,076,548. Value of annimal products, such as cattle slaughtered, wool, butter and cheese, $38,025,698, increase in ten years, $6,588,598. Value of orchard products, beeswax, honey, maple sugar and domestic mauufactures, $5,876,968, increase in ten years, $1,623,354. Making a total of annual products of $110,974,677, against $96,786,177 in 1850, an aggregate increase of $14,188,500.

This sum of total products, $110,974,677, embraces the cost of farm labor, an item, the actual amount of which, we have no census data to determine, but we can approximate to the amount by assuming that it equals the usual proportion allowed by the landlord to the tenant on leased farms, where the tenant furnishes only the labor, which proportion as far as my knowledge extends is one-third. Applying this rule to the case, we have

the sum of $36,991,559, as the cost of labor on all the farms of this State in 1860, and the sum of $32,262,059 for 1850. These labor sums deducted from the value of the year's gross production, gives us $73,983,118 in 1860, and $64,524,118 in 1850, as the earnings of the capital invested in farming in this State, or a trifle over 8 per cent. for 1860, and nearly 10 per cent. for 1850. This calculation, however, is based upon a valuation of about $29 per acre for all the lands in the State, which were returned in the census of 1850, and a valuation of $38.25 per acre in 1860. If we estimate the lands at the actual valuation of 1860, we find a profit of seven and a half per cent. in 1850, and a trifle over eight per cent. profit in 1860.

This result shows an increase in the value of our farms, and a corresponding increase in the estimated capital invested, an increasing ratio of production, and a satisfactory per centage of profit upon the increased aggregate capital.

Here the best data at our command, gives a blunt contradiction to two of the errors that have taken possession of the minds of many people, in regard to agricultural pursuits in this State. First, that the soil is undergoing a gradual but sure process of deterioration, or diminution of its power to produce continued crops; and second, that farming, though very useful in supplying food, is unproductive of profit, and hence not desirable as a source of investment.

These very satisfactory results, which are shown by the figures of the census, are in no small degree the direct and legitimate fruits of our Agricultural Societies, and attest the wisdom of the Legislature, in its venture of a very small encouragement in appropriations to those Societies. And it may not be out of place here, to lay before the farmers of the State, as nearly as may be, the amount and kind of encouragement they have received at the hands of their Government, which is as follows: Since 1841, the Legislature has annually appropriated $8,000, to be divided between the State and county Societies as follows: To the State Societies, $700, and the balance to the County Societies, proportionate to the population of their respective counties. Of this sum, about one-third remains in the treasury of the State, as the proportion assigned to counties that have no Societies, or that have not complied with the terms of the appropriation, that a like amount should be raised by the Society, by subscription or otherwise, and their proceedings reported annually to the Secretary of State.

In 1848, 1849 and 1850, an appropriation of $600 the first, and $1,000 each for the other two years, was made, for the old State Hall, one-third of which was used by the State Agricultural Society, and the balance by the Regents of the University for their geological museum. In 1850 and 1851 an appropriation of $100 each year, for the Museum of the Society. This was the commencement of that valuable collection of curiosities pertaining to agriculture, which is now looked upon with so much satisfaction by every farmer who visits the capital of his State. In each of the years of 1851, '52 and '53, $8,000 was appropriated for the expenses of the old State Hall, and in each of the years 1854, '55, '56 and '57, $1,000 was appropriated for the same purpose, one-third of which is properly chargeable to this Society. In 1857, an appropriation of $40,000 was made for building the

new hall, one-third of which was assigned to the use of the State Agricultural Society, and two-thirds to the geological department of the Regents of the University, and $4,500 for fitting up the rooms assigned to the use of the Society.

In 1857, '58, '59, '60, '61 and '62, $2,000 was appropriated each year for expenses of new hall, one-third of which is chargeable to the Society. There has also been appropriated $9,000 for the entomological researches conducted by Dr. Fitch during the past nine years.

The printing of the Transactions of the Society, a volume which is recognized at home and abroad as the most valuable practicable treatise on agriculture, is done at the expense of the State, as one of its Legislative documents, and is thus embraced in the general printing expenses of the State, and I am unable to separate it therefrom, so as to determine its cost.

Thus it appears that, aside from printing the annual Legislative report on agriculture, the whole amount appropriated by the great State of New York, for all purposes, in aid of its greatest and most vital interest, during a period of twenty-two years, is only $160,112, or the paltry sum of $7,278 per annum. Surely the farmers of the Empire State have not been the *"sturdy beggars"* who have besieged the Treasury of the State from year to year.

Notwithstanding the satisfactory statements by which we are able to show the healthy and prosperous condition of agricultural pursuits, there are large fields of improvement open to the enterprise of the farmer, some of which I desire to refer to at this time.

My attention has been directed to our present system of fencing, and the enormous outlay of capital it requires annually to support it, and hence the question, have we been governed by correct principles in the inclosure of our fields? or have we been drifting along on the tide of apparent necessity, without reference to principle?

In England the Agricultural Societies are offering premiums to those who will eradicate the greatest amount of hedge fence during the year. Some of the tenant farmers insist upon a stipulation in their leases authorizing them to reclaim the lands occupied by the hedges, thus adding to the productive area of the farm, and lessening the annual outlay for supporting the fence. I have heard of one such farmer who had thus added forty-five acres to the tillable land of his farm within a few years.

On the Continent of Europe there are no fences, or at least so few that they are an exception to the rule. The traveler will pass hundreds of miles without seeing a fence of any kind, or even noticing any landmarks dividing farms, and no encouragement is offered there by Agricultural Societies for inclosing farms with fences.

May it not then be fairly questioned whether we are not pursuing the practice of fencing our farms into small fields, at a large annual expense, greatly to our own disadvantage? With a view of inducing our farmers to reflect upon this subject, I submit the following estimates of the cost of fences.

To fence a farm into square fields of two and a half acres each, crediting half of the fence to the adjoining field, requires forty rods of fence, or sixteen rods per acre, which, at $15 per thousand for rails, and $10 per

thousand for stakes, will cost at least thirty cents per rod, or $4.80 per acre, and entail an annual expense in the interest of money, natural decay of material, and labor for repairs, of nearly or quite one dollar per acre. Fields of five acres each require eleven and a half rods per acre, costing $3.45 per acre. Ten acre fields require eight rods of fence per acre, costing $2.40 per acre. Twenty acre fields reduce the fence to five and a half rods per acre, at a cost of $1.65 per acre. Forty acres in a field require but four rods per acre, costing only $1.20 per acre; and one hundred acres may be inclosed in one field with two and a half rods per acre, costing seventy-five cents per acre.

Small farms are quite generally fenced into fields of five acres each, and large farms are regarded as satisfactorily divided if the fields measure fifteen or twenty acres each. Assuming ten acres as the average size of fields into which our farms are divided by fences, we arrive at the following result as to the cost of fencing.

A farm of 100 acres thus divided would require 800 rods of fence, which, of rails and stakes, would cost $240, to which must be added ten per cent. for annual decay and repairs, and seven per cent. for the use of capital invested in the fence, making $40.80 per annum. This fence will occupy a strip of land at least four feet wide, and of the length of 800 rods, will make twelve and a half acres, costing say $30 per acre, which we will assume to be the average value of the farming lands of the State, making the sum of $375, the annual interest of which is $26.25, to be charged to the annual fence account, swelling it to $67.05, as the annual cost of sustaining the cheapest class of fence on a farm of one hundred acres.

To the above might properly be added a considerable sum as damages sustained annually from the rank growth of noxious weeds, which find shelter in the fence corners, and ripen a luxuriant crop of seeds to dispute the possession of the adjoining fields, on each return of spring, with the seeds upon which the farmer relies for his crop, increasing the expense of cultivation, and diminishing the productiveness of the soil.

The sum representing the cost of the fence and interest on the value of land occupied by it, multiplied by the 120,469 farms of 100 acres each, that the improved lands of the State of New York would make if thus divided, represents the vast sum of $7,830,485, as the annual cost of fences in this State. The above estimate is based upon the cost of a cheap rail fence. The cheapest fence I can build on my own farm is of hemlock boards and chestnut posts, costing me one dollar per rod. It is therefore apparent to my mind that the average cost of fencing is much above the figures that I have given, and may safely be assumed to cost $10,000,000 per annum. As an equivalent for this vast annual outlay of money, we enjoy the privilege of turning our cattle out to harvest their own living, by grazing the pastures and gleaning the stubble fields, or running at large in the public highway. Is it a good investment? Do we get a fair and full equivalent for the investment of $150,000,000, for such it really is, as the $10,000,000 which we annually pay to sustain our fences, with our farms as collaterals, would secure the use of that sum by loan? I think we do not; and I desire that our farmers should begin to reflect on this subject, and see if it is not time to commence a reform in that direction.

By confining cattle to the barn-yard or small inclosures, and feeding them in stalls, the necessity for interior fences on the farm would be removed. That this mode of keeping cattle is not only practicable, but highly beneficial to the interest of the farmer, is fully demonstrated by numerous and repeated experiments, made upon both a large and small scale in Europe and America, some of which I will briefly refer to.

The Hon. Josiah Quincy, of Massachusetts, in an able essay on the soiling of cattle, says: "Satisfied in my own mind of the beneficial effects of the practice, I adopted it in the year 1814, and adhered to it until the year 1822, keeping from *fifteen* to *twenty* head of milch cows, with satisfactory success." In 1822 Mr. Quincy left his farm, and did not resume its management until 1847, when he again commenced the practice of soiling. Of this second experiment he says: "Resuming its management in 1847, I immediately returned to the practice of soiling, resorting to the essays I had formerly published, to revive my knowledge on the subject, and from that time to the present, 1857, have persevered in the practice, with such entire satisfaction, that no consideration would induce me to adopt any other. Since 1847 I have kept from thirty to thirty-five head of cows in this way, so that, in my mind, my experience is conclusive on the subject."

Of the advantages resulting from "soiling," Mr. Quincy says: "1st. It saves land. 2d. It saves fencing. 3d. It economized food. 4th. It kept the cattle in better condition and greater comfort. 5th. It produced more milk. 6th. It increased immensely the quantity and quality of the manure." As to saving land, Mr. Quincy says: "*One* acre soiled from will produce as much as *three* acres pastured. This is enough, although some European writers assert the benefit is equal to *one* in *seven*, this great difference arising from the mode in which the one acre is cultivated and enriched for succulent products." On the subject of health he says: "A popular objection to this mode of keeping milch cows is, that want of exercise must affect injuriously the health of the animal. To this, European writers, some of whom have kept in this way large herds, reply that they 'never had one sick, or one die, or one miscarry,' in consequence of this mode of keeping. After more than ten years' experience of the same practice, my experience justifies me in uniting my testimony to theirs on this point.

As to what class of farmers can adopt soiling successfully, he says: "The system I advocate has reference to *arable land, to that portion of it on every man's farm, which is capable of being plowed and mowed over.*" Again: "I answer *every farmer who wants manure at a cheap and easy rate*, the greatest profit of soiling arises from the quantity of manure it enables the farmer to make, more than doubling it upon the same stock."

I could introduce hundreds of pages of testimony of like high character to prove that it is not only practicable, but highly advantageous to confine cattle to stalls or small inclosures, and carry their food to them, in preference to allowing them to roam over pastures in pursuit of their food, but it seems to me uncalled for. The testimony of Mr. Quincy is that of a practical man, who after long years of experience in practicing the system, finds no drawbacks to discourage him, and affirms most fully the testimony of many others, who have published the result of their successful experience in the same system.

In closing this subject I would remark that I do not urge an indiscriminate destruction of fences, or a rash and imperfect adoption of the practice of soiling cattle. What I advise is, that farmers should reflect upon this subject, and wisely prepare themselves for a change that must come sooner or later. I have commenced by doubling the size of my fields, lessening the quantity of inside or division fences, and strengthening the character of outside fences, assuming that those will be the last that we shall dispense with.

The improvement of farm stock is a subject deserving more of our attention than it is receiving. It is true that by comparing the present with the past, we can show a marked improvement, and trace much of our present prosperity to that cause; but we cannot claim our improvement to be the result of any system, and I think it is fair to assume that our ratio of improvement is far below what might be expected from the facilities we have at command. I shall not complain that our farmers do not purchase thoroughbred animals of the improved breeds at high prices, for the purpose of stocking their farms; I think they are wise in not doing so; I know they cannot afford it; I also know that they cannot afford to neglect the improvement of their farm stock. How then can they best do it? I answer by a systematic use of carefully selected thorough-bred males, from the improved breeds, best adapted to the localities and purposes for which the animals are kept. The practice, too common among those of our farmers who attempt improvement, is to seek one cross with a thorough-bred male, and then resort to the use of the half-bred offspring. This is backsliding. The get of the half-bred male will, as a rule, possess less merit than he does himself, and hence time is passing with a diminished ratio of improvement.

Let our farmers adopt as a rule the practice of using thorough-bred male animals, and discard all others, in breeding stock for the dairy or shambles, and the following would be the result in ten years, allowing the females to come in at two years of age. The produce of 1865 would be half-blood. Those of 1867 would possess three-fourths of the improved blood. Those of 1869 would be seven-eighths, and at the expiration of ten years the alloy or common blood would be reduced to one thirty-second part of that represented in the animal; and for all practicable purposes, except breeding, the produce of the fifth and sixth generation, and beyond, would rank in value with the improved breed.

The facilities for such improvement we have at hand, in reasonable abundance and great excellence. Our herds of the improved breeds represent the most noted tribes of the English herds; and the recent bold and praiseworthy experiment of our friend, Samuel Thorne, Esq., of Dutchess county, of sending his young bulls back to England for a market, has given us an opportunity to compare American bred with English Short Horns, and demonstrate to our English friends that their improved breeds do not deteriorate on American soil. Not only the Short Horns, but the Devons, the Herefords, the Ayrshires, and other breeds of undoubted purity of blood, and great excellence of quality, are to be found within the limits of our own State, at prices which should not be regarded as a bar to their general use.

I would suggest to the County Agricultural Societies that they could do

much to stimulate this desired improvement by encouraging system in the selection of breeding animals, and the establishment of a record or herd book under the control of the Society for the entry of grade animals.

To impress the question of improvements of our stock more fully upon the minds of our farmers, I will allude to a few facts in our dairy statistics, and I will select those of Tompkins county, being more familiar with the improvements of that county. The census returns of 1845, for that county, give an average of 102 lbs. of butter for each cow. For 1850, the average was 109 lbs. For 1855, it was 113 lbs.; and the census returns of 1860, which really give the result of 1859, when our pastures were injured by severe drouth, and large quantities of grasshoppers, give the average at 117 lbs. The statistics of that county, representing the crops of 1860, show the average to be 128 lbs. That year the pastures were abundant and the dairy crop a full average. In 1850, Tompkins county stood three pounds per cow below the average of the State, and in 1860 she stands four pounds above the average of the State by the census returns, and fifteen pounds above by the privately obtained statistcs. Several entire daries averaged 200 lbs. to the cow. One entire school district averaged 165 lbs., and three of the towns averaged respectively 131, 132, and 143 lbs. per cow. It is therefore safe to assume that the cows of Tompkins county, at the present time, will supply milk that will make 25 lbs. more butter per head, than would the cows of 1845, thereby increasing the butter crop of the county $55,537 per annum, there being 14,810 cows, and the butter computed at fifteen cents per pound.

This improvement commenced in 1842, by the introduction of thoroughbred Short Horn bulls. The improvement has not however been as great as it might have been, and I am confident if properly pressed it may be carried to an average of 200 lbs. of butter per cow, for the county, and for all the best dairy counties of the State. If I am right, and I believe that I am, then the farmers of my county have the means within reach, of increasing the annual value of their butter crop $150,000 above what it now is, with little or no increase in the cost of keeping their cows, as a poor cow consumes as much food as a good one. A like improvement for the whole State would produce the sum of $11,798,157 per annum.

There are like pressing need for the improvement of our sheep, and it is readily attained by the same means, the judicious selection of male animals for breedng purposes. I know of instances where one pound of wool per head on an average through a flock of lambs, above what their dams produced, has been the result of the first cross of a good ram upon a flock of fine wool ewes. Such results are being produced here and there, all over the State where sheep are kept, and still, the facts are not generally known, or at least are not so impressed upon the minds of the flock-masters of the neighborhood, as to lead to prompt and decided improvements.

The census of 1860 shows the number of sheep in our State, to be 2,657,855, which produced a clip of 9,454,473 lbs. of wool, or an average of about 3 lbs. 12 ounces per head. It is probable that there are now as many as 3,000,000 in the State, and I believe it is within our power at a very small cost, to bring the average product of wool up to 5 lbs. 10 ounces, without any increase in the consumption of food. I make this statement upon my

knowledge of flocks of Spanish Merino sheep, having an average weight of carcass after shearing of 75 lbs., which produce 5 lbs. and 12 ounces of clean brook-washed wool, without grain or extra keep in any form, and it is the general calculation that sheep will consume food in proportion to their weight, and I believe 75 lbs. is below the average weight of carcass, of such of our sheep as are kept mainly for the production of wool. Hence I regard it safe, to assume that the consumption of food by the sheep of the State is as great as would be necessary, if the flocks were so improved in quality as to produce an increased average of two pounds of wool per head. Such an improvement would add 6,000,000 pounds to our annual clip of wool, and $3,000,000 annually to our available means.

It appears then, that the farmers of our State are reaping $15,000,000 per annum *less reward* than they might do from their dairies and their flocks. Will not such facts arrest their attention, and lead more directly to the desired improvement? What richer field can our County Societies desire to labor in? And what higher emulation can they seek, than to strive to see which shall be the first to bring their county up to the indicated standard of improvement? It appears to me to be the highest duty that a County Agricultural Society owes to the community which sustains it, to study well the condition of the agricultural interest of its county, and ascertain wherein it can be most advantageously improved, and encourage such improvements, by all the means in its power, and to this end, more thorough organization is desirable. There should be no jealousy between county and town Societies, and there will not be, when such Societies are organized strictly for the promotion of agriculture and horticulture instead of some local *villageculture*. I should rejoice to see an agricultural organization in every school district of the State, they to be represented in their Town Societies, and at their Town Fairs. The Town Societies should compete with each other at the exhibitions of the County Society, and the County Societies in like manner contend for honors before the State Society. With our organizations so perfected that the State Society, through the proper organs of county, town, and school district organizations, could reach every farmer's fireside, vast benfits would be derived by our agricultural interests which are now lost.

Before closing, I desire to say a word on the subject of education. It cannot be denied that we yet have many farmers who adhere to the old error that a boy requires a better education if he is to leave the farm and seek a living in the other professions, than is necessary if he is to continue on the farm. This is a great and mischievous error. It is placing the young farmer at a disadvantage at every step through life. He can no more rank at the head of his profession as a farmer, without education, than he could take such rank in the profession of law or of medicine while laboring under the like embarrassment. It is this error which has sent the brightest and best educated of our farmers' sons from the farm, to seek employment in other pursuits of life, and retain at home those who have less mental culture and intellectual power, as good enough to do the drudgery of the farm, until the other professions have robbed the farm of many of its brightest ornaments.

This should no longer continue. It is high time that the agricultural

interest asserted its rights in this matter. The nation recognizes the necessity for a higher standard of education for farmers, and has generously provided for it. The parents of those who are to become farmers must recognize the same necessity, and husband well the resources which the nation places at their disposal, attesting the wisdom of Congress in the annual improvement of the farmer and the farm, and the higher elevation of the agricultural profession.

The act of the last session of Congress, donating public lands to the several States and Territories which may provide colleges for the benefit of agricultural and mechanic arts, provides a quantity equal to 30,000 acres to each senator and representative in Congress to which the States are entitled by the apportionment under the census of 1860. New York, having thirty-three senators and representatives, is therefore entitled to 990,000 acres of land, which, if sold at the established Government price of one dollar and a quarter per acre, will create a fund of $1,237,500, which the State is bonnd by the act to protect and keep good as a perpetual fund, which "shall be invested in stocks of the United States, or of the State, or some other safe stocks, yielding not less than five per centum on the par value of said stocks." This will produce an annual income of $61,875, to be applied "to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts," which, if faithfully administered, will do much to place the agricultural student on a level with those of other professions. This is a high trust confided by the nation to the farmers and mechanics of our country, and they must see to it, that it is not diverted from its proper channel, nor impaired in its usefulness by subdivisions among weak and inefficient institutions.

It is a proper and legitimate duty of this Society to foster the cause of agricultural and mechanical education, and watch with jealous care the appropriation of this National College fund, to the end that it is not perverted from the lofty purposes for which it was set apart by Congress.

In drawing my official labors, as the President of your Society, to a close, I feel it incumbent upon me to express my sincere thanks to my immediate predecessor, the Hon. George Geddes, and to the gentlemen of the Executive Committee, for their efficient support and co-operation in conducting the affairs of the Society, and carrying it successfully through the past year, and especially during my absence from the country.

I am under like obligation, and embrace the present occasion to tender my thanks to the Board of Managers of the Monroe County Agricultural Society, the Common Council of the city of Rochester, and many of the distinguished citizens of Rochester, for their generous and efficient aid in making preparations for and in conducting our last annual fair to a successful issue.

Regretting that it has not been in my power to render more valuable services to the Society during the past year, and pledging my future co-operation in whatever may tend to advance the interests of the Society and the cause it has at heart, I turn with satisfaction to the performance of my last official duty, the introduction of my successor, Mr. Edward G. Faile.

AGRICULTURAL DISCUSSIONS AT THE STATE FAIR, ROCHESTER, 1862.

On Tuesday evening, September 30, *Dr. Asa Fitch*, Entomologist of the Society, delivered an interesting lecture on the *Aphis*, which has been so destructive to the crops of oats, spring wheat, barley and rye. The farmers present had many questions to be answered, and the discussions which arose after Dr. Fitch had concluded his remarks, were very interesting.

Hon. A. B. Conger, ex-president, who was chairman of the meeting, pursuant to a resolution of the meeting, prepared and published a summary of the conclusions arrived at, on the subjects discussed.

THE APHIS.

1. It is a general law of nature, that insects injurious to vegetation have their parasites and other natural enemies, which are sooner or later developed in sufficient numbers to exterminate the race they feed upon.

2. The aphis avenæ, the insect which, during this season and the last, has destroyed large crops of oats, spring wheat, barley and rye, is undeniably of the louse species, having almost incredible powers of fecundity, developing from a single female, and without the intervention of the other sex, over two millions in twenty days.

3. Its enemy is of the lady bug species, perfectly harmless itself to vegetation, but an active poison, probably, to the domestic animals, should they be turned upon the stubble too soon after harvest, when the lady bug or coccionella has finished its attack upon the aphis.

4. The aphis is unlike the midge or Hessian fly, in the above particulars, except in the general characteristic of their being severally provided with the parasitic destroyers, and in having their ravages limited by conditions of the atmosphere and of heat and moisture, which are not clearly defined in some cases by early maturity, and by constitutional peculiarities in certain varieties of seed which possess a greater toughness of the pericarp, or outer covering of the seed.

5. The practical question which remains for the farmer is to determine whether he may not, by careful selections of seed, and by a more thorough tillage and judicious application of plant-food, develop his crop, so as by increasing its constitutional vigor and in effecting an early maturity, to render it a less easy prey to the ravages of any of the insect tribe now known, or that may hereafter be discovered.

Benefits of Underdraining.

On Wednesday evening, October 1st, the benefits of underdraining elicited a very animated discussion, the substance of which we give in addition to the very valuable summary by Mr. Conger, which embodies the

conclusions arrived at by the very intelligent farmers who were present in large numbers.

1. The principal benefit to be secured to the farmer, by underdraining, lies in the more *thorough tillage* he is able to give his *arable* land; yet instances are not wanting, where *pasture lands* are very profitably improved from what may be denominated the *primary* or simple method of draining.

2. In the discussion of this subject, soils are properly divided into those which produced, to a greater or less extent, *aquatic*, and those which bear the *cultivated grasses;* the former being nearly destitute of nitrogen, or the flesh-forming principle.

3. As the supply of nitrogen for plants is mostly derived from the atmosphere, soils not possessing the natural or artificial means of drainage for the surface water, or that welling up from the stratified subsoils, are unable to allow the atmospheric air to circulate in them, and cannot absorb any portion of its nitrogen, and are generally regarded as barren or waste land.

4. The average annual fall of water in the State of New York, in the form of rain and snow, is within a fraction of three (3) feet, of which only one twenty-fourth (1.24) is appropriated by plants; seven-twelfths (7.12) pass off by evaporation, and three-eighths (3.8) are carried away by water-courses, either open or moving beneath the earth's surface.

5. Where these water-courses are deficient in number, imperfect in flow, or obstructed in their outlet, the first essay of the drainer is to remedy these defects; and where the adjacent land is porous in its character, as in the case where sandy particles predominate, the simple ditch, judiciously located, is sufficient to provide for the escape of all surplus water.

6. Where, in addition to the annual supply from the skies, the soil is saturated with water boiling up from the stratified subsoil, or underlying or adjacent rocks, it is then expedient, by *boring*, to conduct the excess of this supply to the main ditch directly, or by lateral drains leading into it.

All these methods may be classed under the primary method of drainage.

7. In soils deficient in, or wholly deprived of, sandy or porous constituents, the escape of the twenty-three twenty-fourths (23.24) of the rain and snow fall is retarded, the average temperature of the soil is lowered by six and a half degrees (6½°) of Fahrenheit's scale, equal to seven degrees (7°) of higher latitude, and the water forced up from the fissures of adjacent stratifications (if any there be,) make the receipts of a more thorough system of drainage, which may be styled the secondary or complex method.

8. In proportion to the density and tenacity of the soil, ditches must be dug at intervals varying from twenty-five (25) to fifty (50) feet apart; and in order that the plowing and laying down of the land may be effective, the ditches must be covered; and this has inaugurated the system of tile draining, at an expense of from twenty ($20) to forty ($40) dollars per acre, rendering land, previously of but little value, capable of the highest production.

9. This, however, can never be fully realized, unless the draining is followed by the deepest plowing, not only by the ordinary, but by the subsoil plow, and also by a system of high manuring, which shall supply not only nitrogenous manures, and those rich in the mineral food of plants, but

also those which abound in carbonaceous material, and will insure a perfect æration of the soil, and prevent its subsidence to its original compact and impermeable condition.

Care, however, should be taken that none of these several materials should be supplied in excess; and economy requires that neither should be added to soils enjoying it naturally in sufficient amount and in a soluble form.

10. The draining should only be undertaken after a careful survey by a competent person; the drains should be accurately delineated upon a map for future reference; the tiles should be laid on an uniform grade, so as to avoid sags in which silt might accumulate; the outlets should be as few as possible and carefully guarded, and, in some cases, with traps, to prevent their stoppage on the entrance of vermin.

11. As illustrative of the vast importance of this subject to the farming interests of the State of New York, it is believed that but a comparatively small portion of its arable land possesses a good natural drainage; a large proportion has this, but in an imperfect degree; and probably ——* per cent. has none at all, but demands a thorough application of the methods of the secondary system of drainage.

Insects—The Grain Aphis, Wheat Midge, &c.

Dr. Asa Fitch, Entomologist to the State Agricultural Society, opened the discussion by reading the following Essay on the grain aphis:

Mr. Chairman and Gentlemen:—I am requested to preface the discussion this evening by presenting to the audience some account of the grain aphis, an insect new to us in America, and which, during the past and the present year has been more prominent in the public regard than any other insect.

In the grain fields of Europe this grain aphis has existed from time immemorial. It was scientifically named and described eighty-one years ago, by the distinguished German entomologist, Fabricius, who met with it in fields of oats, and therefore named it the *aphis avenæ*, or the oat aphis, he being unaware that it occurred equally common upon other kinds of grain also.

But our European accounts of it are quite meager and imperfect. About all that we gather from them is, that it is an insect which shows itself upon the grain about the time of harvest, and that in some instances it has been known to be so multiplied, in particular places, as to literally swarm upon and cover the heads of the grain in many of the fields.

These few general facts, is all the information which the world has hitherto had of this insect. What becomes of it during the remainder of the year, where, and in what condition it lurks after harvest time, and until harvest time again approaches, had never been investigated. It was remaining for us in this country to trace out its abiding place and its habits during the autumn, winter and spring, and thus complete its history the year round, as we have been able to do within the past eighteen months, under the instructions of this Society, and under the auspices of the State of New York.

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* This per centage was to have been supplied by Hon. T. C. Peters, of Genesee, from notes taken by him while engaged in the work of equalising the assessments of landed property in the State, and will doubtless be furnished to the Society at an early day.

In this country this grain aphis had never been observed, and it was not known that we had such an insect here, until last year, when it suddenly appeared in excessive numbers over all the New England States, and the State of New York, except here in its western section, and also in the adjoining districts of Canada and of Pennsylvania. Throughout all this vast extent of country every grain field was invaded by it; many of these fields were thronged and a portion of them were literally covered and smothered by this insect.

This year it has moved westward, making its appearance in the same manner all over Western New York, Canada West, Northern Ohio, and at least a portion of Michigan, as I judge from the numerous letters which have been sent me with grain heads containing this insect, and from the notices of it in the public prints, whilst at the East, where it was so numerous last year, it has measurably disappeared this year, so that, except in a few localities, it would not have been noticed had not everybody been so eagerly searching for it.

But though this insect has only been noticed in this country the past and the present years, we do not suppose it has newly arrived upon this Continent. It has no doubt been present in our grain fields heretofore, but in such limited numbers, and so scattered about upon the growing grain that it failed to be observed. It is seventeen years ago that I began to examine the wheat midge, and in looking at that and other insects upon the wheat, I recollect I have occasionly seen this aphis. But as only two or three individuals of this kind were to be found at a time, I supposed it to be of no importance, and thus gave no attention to it, until it began to appear in such abundance the past year.

Although it is a common habit of plant lice to become extremely numerous, at times, upon the particular kinds of vegetation which they respectively infest, we meet with no recorded instance in which one of these insects has been known to become so suddenly and excessively multiplied over such a vast extent of territory as has happened in our country with this grain aphis the past and present years.

I suppose almost every person in this audience has seen these insects, crowded together upon the heads of wheat, of oats, barley or rye, and has observed that they were a kind of plant louse, similar to what we frequently see upon the leaves of cabbages in our gardens, and on the apple, the cherry, and other trees. As it resembles these common and well known insects so closely in its form, its motions and habits, it will not be necessary for me to give any particular description of it.

With regard to the mode in which it injures the grain, I would observe that it has a slender, sharp pointed bill or trunk, which it holds under its breast when this implement is not in use. With this it punctures the leaves and stalks of the grain and sucks their juices. It therefore has no occasion to leave the particular plant on which it is born, as it always has an ample store of nourishment directly under its feet. Hence it has no use for wings to carry it, like other insects, from place to place in search of food. It needs wings for only one purpose, namely, to enable it to emigrate to fields of grain which are unocupied, in order to start colonies in them. Only a small portion of these insects, therefore, acquire wings;

and these fly away from the winter grain to plant their race upon the spring sowed wheat and oats.

The latter part of June, when the grain has advanced so that the heads or ears begin to put forth, two most remarkable changes occur in this insect, whereby it appears to become another creature, a different species, in the middle of summer from that which is seen in the spring and autumn.

One of these changes is in its habits. Before the heads appear it lives singly, scattered about upon the leaves and stalks of the grain, and the young lice, as fast as they are born, leave their parents and wander away. But no sooner are the heads protruded from their sheaths preparatory to blooming and growing the kernels of the grain, than this aphis wholly forsakes all the other parts of the plant and becomes congregated upon the heads, evidently because the juices which the plant elaborates for the growth of its flowers and seeds are much more nutritious, more dainty and palatable to these insects, than are the juices which circulate in the leaves and stalks. They here fix themselves upon the base of the chaffs which envelop the kernels, and inserting their beaks, they suck out the juices which should go, first, to grow the flowers, and after that to fill and perfect the kernels. And now the young lice which are born, instead of scattering themselves and traveling away, settle down closely around their parent, crowding as compactly together as they can stow themselves. Thus it comes to pass that when these insects are numerous, as we have recently had them, in many of our grain fields, scarcely an ear can be found which has not a cluster of these lice around the base of almost every kernel, all with their tiny bills inserted therein, pumping out the juices which should go to swell and perfect the seed. Thus, this grain aphis from being a solitary insect, wandering about singly upon the leaves and stalks, becomes a gregarious insect, clustered together in flocks, and remaining fixed and stationary upon the lower or but ends of the kernels.

At the same time another change, equally remarkable, takes place in the *color* of these insects. So long as they nourish themselves on the coarse juices of the stalks and leaves, their bodies are all of a grass-green color. But when they come to feed on the more delicate juices of the flowers, they begin to bear young of an orange color. One of the grass-green insects having stationed herself at the base of a kernel, the next day, in the group of little ones around her, a yellow one will occur, all the others being green like their parent. A day or two later, as the nourishment she derived from the leaves becomes more dissipated from her body and replaced by that now obtained from the kernels, half the young she produces will be of this yellow collor. And still later all the young are yellow, no green ones being any longer born. And the older ones after a time dying and disappearing, all these insects some weeks before harvest time, become changed to a yellow color, their hue inclining more to red in some and to yellow in others.

It is truly curious that this green insect, thus, on coming to feed on the juices which grow the flowers, begin to produce young of a gay yellow color similar to that of the flowers.

By depriving the kernels of a portion of the milky juice which should go

to swell and mature them, this insect causes the ripened grain to be more or less shrunken and light of weight.

Rye, however, grows so rapidly and ripens so early, that it outstrips this apis, in its increase, and thus sustains no material injury from it. Winter wheat, ripening more slowly, experiences more injury. But the crops which ripen latest, and when this apis has become multiplied to the greatest extent, namely, spring wheat and oats, become the most thronged and sustain the greatest injury.

Let us next inquire how it is that this insect is able to become so suddenly and so excessively multiplied as we have had it, in the eastern part of our State last year, and here in its western part this year.

I may observe that a hundred years ago it was a current opinion among men of science, that certain insects and other creatures pertaining to the lower orders of the animal kingdom were generated spontaneously. But, more recently, when these instances of supposed spontaneous generation came to be closely investigated, one after another of them were found not to be such. So that at this day the scientific world wholly discards the theory that there is or can be any such thing as spontaneous generation. All living things descend from parents; and it is by a pairing of the sexes that young are produced and that each species is continued in existence—some classes of animals bringing forth their young alive, others laying eggs from which their young hatch.

Insects are of this latter kind. They are all produced from eggs. But in the generation of the plant lice, we meet with one of the most remarkable anomalies which we anywhere find in the works of nature. These insects bring forth their young alive, at one time, and they lay eggs at another time. All the plant lice which we see upon our fruit trees during the spring and summer are females, and these do not produce eggs, but living young, which mature in a few days, and (wonderful to tell!) they are fertile without any intercourse of the sexes. It is only when cold weather and frosty nights arrive, that males are produced. The insects then pair, and the females thereupon lay eggs. These eggs remain through the winter, to be hatched by the warmth of the following spring. The young from these eggs grow up and commence bearing living young, no males and no eggs being produced, except as the closing act of their operations in autumn.

Such are the general facts with regard to the generation of the insects of this aphis group. And I had supposed it would be the same with this grain aphis. Some of you may have been present and heard the remarks which I made on this subject at our fair at Watertown a year ago. I stated that the eggs of this insect would probably be found late in autumn, scattered about upon the leaves of the fall sowed wheat and rye—which eggs would hatch with the warmth of the following spring, to start the insect upon the grain again this year. But when frosty nights arrived last autumn, and when the aphis on the apple trees was found paired, and the females were busy depositing their eggs, to my surprise, nothing of this kind occurred with this aphis upon the grain. The mature lice continued to produce young ones, until they and their young became congealed upon the leaves of the young grain by the advancing cold of the season. And

in this state they were buried beneath the snows of winter, and with the warmth of the ensuing spring they were thawed, and returned to life again.

To be better assured upon the subject, I placed some of these insects on grain growing in flower-pots and kept during the winter in a warm room. In this situation they continued alive and continued to bear young through the whole winter season.

Thus I have watched this grain aphis this year round, so closely, that I am perfectly assured no eggs were laid and no males were produced. Occasionally an individual was noticed, varying somewhat from the others, and which I have therefore suspected might be a male; but, on imprisoning such specimens in vials over night, I have invariably found young lice with them next morning.

When, and under what circumstances males occur, if they ever do occur, is yet remaining to be discovered. At present it seems as though these insects might go on forever, producing young, without any intercourse of the sexes.

Finally, with regard to the fecundity of these insects, I would state that those which have no wings, and which remain on the stalks of grain on which they are born, are much more prolific than those which have wings and wander abroad. By inclosing them separately in vials, I found the winged females quite uniformly gave birth to two young lice in a single night, whilst the wingless ones produced four in the same time. We frequently see young lice produced in the day time, but fewer appear to be born then than during the night. The winged ones are also much slower in coming to maturity. I placed several young lice the morning after they were born upon some grain growing in a flower-pot, and on the third morning afterwards I found four little ones around each of them, showing that the wingless ones come to maturity in three days. It will thus be seen with what prodigious rapidity these creatures multiply. They almost double their numbers daily. A single one producing four young daily, and these becoming equally prolific when they are three days old, her descendants in twenty days, if all live, will number upwards of two millions. This will serve to explain to us how it is that this insect becomes so excessively numerous upon the grain at harvest time, as we have seen it.

As they multiply so rapidly, it is evident no vegetation which they infest would escape destruction from these plant lice, if nature had not herself provided most efficient means for checking and subduing them. We accordingly find that these insects are preyed upon and consumed by other insects, to a greater extent than are any other kinds of injurious insects wherewith we are molested. There are whole groups and tribes of predaceous insects which subsist exclusively upon the plant lice of different kinds.

A tribe of very small Ichneumon flies, named Aphidius, are parasitic destroyers of these insects—puncturing and thrusting an egg into the body of the aphis, from which hatches a minute worm which feeds within the aphis till it kills it. I have found two species of these parasites destroying the grain aphis.

Another most efficient destroyer is the lady bug or coccinella, of which

there are numerous species, all of which are continually searching plant lice to feed upon, these being the sole nourishment of the lady bug, both in its larvæ and its perfect state.

In addition to these are the synphus flies, the golden-eyed flies, and the lace-wing flies, all mortal enemies to the different kinds of aphis.

By such means is it that these plant lice upon the grain as on other vegetation, are usually but a transitory evil—these, their foes and destroyers, always gathering around them wherever they become numerous, and multiplying until they overbalance and subdue them.

Some one asked for a description of the lady bug. Dr. Fitch described it as follows: It is about the size and shape of half of a small pea, of a yellowish red color, with round black spots upon it.

Question.—Is it poisonous to animals?

Dr. Fitch knew a single instance where swine had been pastured in a field where the lady bug was numerous. All of the herd were taken sick and some of them died. The swine were removed from that field to another, and such as were so removed recovered. Dr. F. said that it was possible that the swine were poisoned by eating large quantities of the lady bug; for if it is taken in the fingers and crushed, an acrid juice is emitted, which is doubtless poisonous, inasmuch as it is the insect's only means of defence. He had thought it possible that this particular herd of swine might have been poisoned by it.

Question.—Is there any prospect of the aphis becoming a permanent pest in the country?

Answer.—I think not. Its enemies are too numerous for that. Not more than a single year at a time, will they be likely to ravage in a single locality. As before said, they seem to be migrating westward.

Question.—Is the midge a permanent pest; is it plenty here at all seasons?

Answer.—There is no doubt that the midge is plenty in all parts of the country. The character of the season governs its ravages. If the latter part of June is wet, look out for the midge; if dry, there is no danger. In dry weather it cannot subsist on the uplands; it returns to the lowlands.

T. C. Peters—We are fast reaching the maximum of former years, in the amount of wheat sown in Western New York, and it is an important matter to us to know how to avoid the ravages of the midge. Do you recommend thorough culture?

Dr. Fitch—Strong growing wheat will produce despite the midge. Yes, I do recommend thorough culture as one of the preventives of the ravages of the midge; also of the Hessian fly and other insects.

Question.—What is the effect of the work of the aphis upon the grain, upon the kernel?

Answer.—The insect extracts the juices from the plant which aid in developing and maturing the kernel. This diminishes the size of the grain, sometimes virtually destroying it, for the substance is almost gone.

Mr. Geddes, of Onondaga, does not agree with Dr. Fitch concerning his theory with reference to the existence of the midge. He doubts if the midge exists in as great numbers one year as another, or if they are present at all, for prior to the past six years he had failed to get a crop of wheat

for some years on their account, while the past six years he had grown it successfully. His success, he thinks, is not due to dry Junes, but to the fact that the midge had disappeared. He doubts, too, if his success is due to superior culture, for he used to summer fallow all his land, now he turns it over and seeds after barley, and oats, etc., etc.

T. C. Peters.—So far as white wheat is concerned, the theory of the effect of the season upon the ravages of the midge upon it, is correct. But the Mediterranean is the only variety that can be grown now safely. He thinks the white wheat has very much degenerated.

Other gentlemen present coincided with him in this matter and united in asserting that the best mode of redeeming white wheat was to change the seed. It was further agreed that the Mediterranean had greatly improved by cultivation—that it was "bleaching out."

Mr. Bishop, of Wyoming, asked if early or late sowing had not had to do with checking the ravages of the aphis?

Dr. Fitch replied, yes. Its ravages are greatest on late sown wheat. Late sowing is not advised, if the object is to avoid its ravages. The same remark applies conversely to the midge. It does not so seriously affect the late as the early sown wheat.

President Cornell.—Have you observed the aphis in the ground around the roots of the barley?

Dr. F. had so discovered it.

Mr. Geddes—Why is it that the midge should have appeared one year, and not doubled the second and tripled the third, etc., etc.? He thought the midge was disappearing.

Dr. Fitch said there were two successive years when the midge disappeared, and then the third year appeared again and was very destructive. He does not think it was because the midge passed away from the country, but because the season was not favorable to its development, or at least not favorable to its operations on wheat; it passed to some other grain.

At this point there was a rambling conversational discussion upon the relative value of different varieties of wheat. Much of this the reporter was unable to hear. But he heard enough to establish the fact that there were many present who believed the Mediterranean the safest and best wheat to sow; that it was improving in character, while the white wheat of the Genesee Valley was deteriorating. A few claimed that better flour could be made from the Mediterranean than from any other wheat.

DRAINING.

Hon. George Geddes, of Onondaga, ex-President of the Society, read the following paper:

The average fall of water, in the form of rain and snow, in the State of New York, is 35 28-100 inches. At Rochester the fall is 31 20-100; while at Lewiston it is only 22 41-100 inches. At Rochester there are 177 days in the year in which rain or snow falls, and the total amount of water that falls on an acre is nearly one million of gallons. This water, by flowing over the surface, by percolation, and by evaporation, is carried off the ground; by streams and rivers part of it finds its way to the sea, and thence by evaporation to the clouds, and in rain and snow again falls to the earth. The average water fall of the State is disposed of, by 5 30-100 inches running away in the streams as their ordinary flow, 7 95-100 inches in freshets, and 20 47-100 evaporates from the earth's surface, leaving 1 56-100 for consumption by plants, and in various other ways.

Perfectly dry earth is one-third lighter than earth perfectly saturated with water, and every foot in depth contains seven inches of water when saturated, and will part with one-half of this water and not be too dry to support vegetation. Soils, considered mechanically, consist of particles of all shapes, from the size of pebbles down to the finest powder. These particles cannot touch each other at all points and in all places; thus spaces, of greater or less magnitude, that communicate with each other, exist in endless varieties and forms, making *canals* for water and air to pass through between the particles. In well pulverized soils they equal one-fourth the whole bulk, and one acre of soil pulverized eight inches deep will thus have spaces equal to 12,545,280 cubic inches. The particles of the soil are themselves filled with very minute *pores*. These pores in the particles, though they may freely communicate with each other in the interior of the particles in which they occur, have no direct communication with the pores of the surrounding particles. If the soil is perfectly dry, the canals are filled with air. If the soil is perfectly flooded with water, the canals can contain no air. If there is just sufficient water in the soil to give the most healthy condition to plants, the canals between the particles will be free from water and filled with air, while the pores in the particles will be filled with water. This condition of the soil is commonly designated as moist; the earth will crumble to pieces when handled, without adhering together in the form of mud. Sandy soils, made up of coarse particles of flinty matter, have few pores, and large canals; thus the air circulates freely, and the soil soon becomes too dry for healthy vegetation. The water that fills the canals between the particles of the soil is called in some works I have read, *free* water; I prefer to call it the *water of drainage;* it is this water that makes it necessary to drain soils.

The first great injury that this water of drainage does the soil, that I

desire to call your attention to, is its effect on the temperature. Mr. Dempsey says that he found by careful experiments, that excess of water reduced the temperature of soils 6½ degrees of Fahrenheit in summer. So that if we have two fields lying side by side, one of them thoroughly drained, the other filled with water, they are to be considered as seven degrees of latitude, or two thousand feet of elevation, apart, so far as the temperature of the soil is considered.

The second point to which I desire to call your attention, is the injury resulting from the exclusion of air from the soil. Without air in the soil nothing but aquatic plants will grow, and in undrained land the farmer must delay planting in the spring until evaporation has removed the water from the surface, or he will put his seed in the ground but to rot.

Most soils are partially drained by natural processes. Some soils are in this way perfectly drained, but many large districts of land, abounding in all that is necessary to produce large crops, are rendered useless by excess of water, and until it is removed by artificial drains, are of little or no value. Various things indicate to the practical and experienced farmer the places that require draining; among them may be mentioned the presence of wide-leafed plants growing in tufts, the presence of water in digging post-holes, and the places where early and late frosts do the most injury to his crops.

The best manner of removing any excess of water must be determined in each case by its peculiar circumstances. If only the rain that falls on the field is to be provided for, the case will be a simple one. Find the line of greatest descent, and make drains often enough and deep enough, and carry the water by the shortest lines to the best outlet. On stiff, retentive clays, this will be an expensive process, for the drains must be near each other; but as expensive as it is, this is the only way to make the land of value, and from extensive inquiries made of those men who have made the largest outlays of money in this way, in our State, I am satisfied that no money can be better invested by the owners of such lands. I have uniformly heard these men speak in strong terms their satisfaction as to the results obtained.

In many cases lands are rendered too wet for successful farming, by springs that owe their origin to water that has settled down through the soil of some distant field, and has found its way through sand or gravel, based on a stratum of clay, to its outcrop. These springs may be cut off, perhaps, by a single drain, and thus dry acres of ground; or, the rains that fall on extensive plains may find their way through many feet of earth to some stratum of gravel that descends for many miles, and then bends upward, and thus delivers the water, in boiling springs, on land that but for this subterranean supply would be dry. Wells sunk at proper points may receive such supplies of water, and a few drains carry it off, and at little expense.

The case last mentioned requires great skill on the part of the man who directs the work, or money will be thrown away. In my own experience, I was a great sufferer by a mistake in such a case. I cut many ditches in a field without draining it, because the water was due to a subterranean supply that pressed upward through my clay meadow. A single well, that

reached down through the clay to the underlying gravel, would have allowed all the water to come up, and thus have relieved the whole field. Careful study of the sources of the water, and thorough knowledge of the stratification of the earth, is necessary in many cases to decide on the proper plan of the work, or great disappointments are likely to be experienced. Many beginners in draining suffer great losses for want of this kind of knowledge.

We can hardly say that there are yet in this country men that devote themselves to the business of giving the instruction that inexperienced beginners require in this branch of engineering; but in time we shall have these men as well known as they are now in England. For want of these advisers, perhaps the best thing for a man who intends to lay out much money in draining to do, is to consult books written especially to give the required information. The best of these books that have come under my observation are Dempsey's Rudimentary Treatise on the Drainage of Districts and Lands, (this is an English work, and by far the most able I know,) and French's Farm Drainage, an American book, so written as to be well adapted to our wants, very easy of comprehension, and of great value in every respect.

I close these remarks, which are intended to only open the discussion of this evening, by saying that the modern art of draining is not a century old. It may be said to owe much to the discoveries of a Warwickshire farmer, Mr. Joseph Elkington, who, in 1764, happening to drive an auger through the bed of a trench, discovered the existence of a water-bearing stratum beneath, by drawing the water from which, the surface and subsoil became thoroughly drained. From this accident came into being what is known as Elkington's System of Drainage. In 1795 the British Parliament voted £1,000, and the Board of Agriculture employed Mr. John Johnstone to write a book under Mr. Elkington's directions. In the writing of this book, this John Johnstone is said not to have been as successful a teacher as our John Johnston, of Geneva, has proven to many of us.

Mr. Peters, of Genesee county, believed a system of draining, judiciously conducted, on the cultivated lands of this State, would add one-third to its productions. But little land in the State but might be benefited by drainage; in some cases the productive power can be doubled. He regarded the effect of drainage on the temperature of the land of great importance in arriving at the true value of drainage. It makes 100 per cent. difference in the value of the soil, in the matter of altitude. Drainage brings the temperature down from the mountain side to the valley. Early frosts in autumn are prevented, and good corn lands are made out of our Western New York wheat soils, by draining.

In answer to a question as to the proper distance apart and depth of drains, Mr. Foster, of Seneca county, said he lived close to John Johnston, and could give his practice. His drains are 2½ feet deep, and 2 rods apart.

Mr. Swan, another neighbor, drains in the same way, and by doing so has caused land to produce forty bushels of wheat per acre. The effect is good. The grass crop has been increased more in proportion than the wheat. The effect of Mr. Johnston's example and demonstrations has been to largely increase the amount of land drained.

Mr. Foster sought to impress the importance of making a map of the ground to be drained and laying the drains according to the map; recording the distances, in order that, if it was found necessary to increase the number of drains, it might be done intelligently, and without interfering with what had been done. Some men, who had neglected this matter, had laid new drains too close to old ones, incurring great expense without proportionate benefit. Tile is to be preferred to stone drains.

Mr. Brooks, of Wyoming—What does it cost per acre to drain with tile?

Mr. Foster—About twenty dollars per acre. Four inch tile are used in the main drains, and two inch in the minor drains.

Mr. Brooks—Was it the draining or the manure applied to the land, that increased its product to forty bushels of wheat per acre?

Mr. Foster—When lands want draining, the manure applied to such lands is thrown away. When lands are drained, the manure, if applied, is not lost, nor the lands injured.

Mr. Peters—There are few localities in this State where thorough drainage will not pay. Up to midsummer water will stand in post-holes dug in almost all parts of the State. On such lands clover kills out, grass is coarse, and frosts come early in autumn. Had seen water stand on the surface of some soils right over drains—but it was on stiff clays, that had been partially puddled in the process of draining. The same soils, broken with a plow or harrow, the water would disappear. Wished to ask Mr. Geddes if he supposed the water, when it falls on the earth, sinks to the water-level, wherever that may be, and then rises until it finds a way to run off, or evaporates.

Mr. Geddes said the water might stand in puddled clay anywhere,—right over a drain,—and yet the soil be thoroughly drained. The water undoubtedly goes down till it reaches the water surface, and then rises into the tile or drain. It does not run to it. Drains serve to lower the water-level. Drains should be 2½ or 3 feet deep; in most cases would rather have them three feet deep than less. The matter of depth and distance depends something upon the character of the soil and the cost of tile. If the soil is hard and tile cheap, dig shallow, and make drains near each other; if tile is costly and soil soft, dig deep and a greater distance apart.

Mr. Faile, of Westchester county, gave an instance of a farm that was worthless, that had been made, by an outlay of $30 per acre, worth $200 per acre.

Mr. Brooks, of Wyoming, had pronounced draining the stupid burying of property. He had been surprised at the course of the discussion of this subject. It had been discussed without qualifications. It had qualifications. In Allegany county there was scarcely an acre of land that had been underdrained. It would cost $25 per acre to drain this land, and it was worth $25 per acre now; but it would not sell for $50 per acre after it was underdrained—so that there is one section of the State that will not pay for draining. In order to make draining profitable, land should be worth something after it is drained, and before also. There is land that will not bear white beans if you drain it to the center of the earth. The cost of doing this work is some consideration. Much depends upon locality, mar-

kets, and the kind of husbandry adopted. Three-fourths of the land of the United States does not need draining.

Mr. Thomas of Cayuga, wished to say a word without directly replying to the opinions of Mr. Brooks. He had put in fifteen or twenty miles of tile drain, and in one case he was sure that he was benefited $500 by the expenditure of $100. He says it is of less importance for a poor farmer to underdrain, but a good farmer cannot afford to neglect it. A thorough farmer uses every economical appliance to increase the product of the farm. His draining cost about $30 per acre, which was returned by the increased production in about three years. Drains should be thirty to thirty-five feet apart, and thirty-three to thirty-six inches deep. He is sorry to hear underdraining discouraged. He has found it profitable, not only where he grows nursery stock, but on a farm where ordinary farm crops are grown. On a tenant farm where the tenant told him he could not live without draining, very heavy crops are now grown.

Mr. Brooks said he did not wish to be understood as opposing draining in all cases and under all circumstances, but he did not think it advisable to recommend it without qualification. He had sheep walks on lands in Allegany county that were paying him the interest on $25 per acre, and he was satisfied that it was a good investment, but he did not believe the per cent. of profit could be increased in that county by an investment in underdraining. He did not believe the grass product could be increased a ton per acre. He had found irrigation profitable, however. Had cut five or six tons per acre—guessed at when it was not *very* dry—on a bottom land that has not been irrigated. But, in answer to a question, he conceded that the land was naturally underdrained.

[There is little doubt of the value of irrigation in all cases, when the water can be made to pass gradually through the soil, or even flow gradually off it. In all cases where drainage is perfect, a heavy fall of water gives to the soil fertility.]

Mr. Baker, of Steuben county, had increased the value of his land, by draining, from $40 to $125 per acre. He believed thorough underdraining an essential preparation of the soil to receive the benefits of irrigation. He has found drainage to pay on lands used as sheep walks. The product of grass per acre is increased, and the sheep are healthier when grazed on such land.

Mr. Peters said the soil of Allegany county was covered with a coarse grass, indicating the necessity of drainage. He believed the increase of the products in that county by drainage would more than pay the interest on the money expended in that way. He doubted if there was in that county a farmer that would not be benefited by underdraining.

Mr. Brooks.—The question is whether the benefit will be proportionate to the cost of draining. I do not believe it would.

Solon Robinson was unwilling to allow the aspersion to rest upon the farmers of Allegany county that they did not know their interests sufficiently to adopt a system that has in all cases, where successfully practiced, doubled the value of the land, counting its value upon the basis of the interest it produces. An expenditure of $30 an acre for draining will hardly ever fail to increase the products of the land so as to give it an

increased value of $100 an acre. The improvement is not only in freeing the soil of water, but in airing it so that it becomes more friable. Undrained land that plows up in clods in spring, when drained crumbles easily and earlier. This is the experience of Mr. Thomas, and so it is of every one who has practiced the system.

Mr. Geddes inquired if there was any one present who had ever lost money by underdraining.

Mr. Prindle, of Genesee county, said that he had lost money by underdraining, still, he believed that there are cases where it would pay. The soil that he operated on was a hard-pan clay. By his argument, however, against draining, he proved that he did his work very inefficiently, using his eye only as a level, and that some of his drains have stopped by failure of tiles or some other cause.

Mr. Geddes said that the question of how to drain hard-pan is answered in all the books upon drainage. The operation of draining the hardest kind of clay is to dig it and crack it, and finally drain it, though it may be more expensive, and require drains every ten feet, but the stiffened clay can be drained. He said that he had lost money by draining, but it was through ignorance of the business. But because I sunk money from ignorance I did not cease the effort to drain all the land upon my farm that needed it, and the result has been in the highest degree satisfactory, for it has been profitable.

In the course of the discussion a remark was made conveying the impression, either that the soil of the prairies produced enough without draining, or that, because land was cheap and rich, and produce low, it would not pay to drain; that farmers had better go to the prairies, where they need not drain, rather than invest so much money in Eastern lands. The reporter hereof announced himself from Illinois, and reported that the Suckers were sensitive to anything that reflected upon their pluck, their patriotism, or their prairies. The prairie soil was not too poor to underdrain; it was rich enough to pay for draining; it did pay to drain it; and no one need migrate to the prairies with the hope of succeeding in their cultivation without draining them. Tile is little used, but the mole plow, or ditcher, is a good substitute, making durable drains on most prairie soils.

The effect of drainage on temperature is a very important feature of drainage. It should not be overlooked. It not only elevates the temperature of the soil, but it lengthens the season materially, securing the development and maturity of the crop. Had seen a striking illustration of this in 1859. Early in September there had been a heavy frost, seriously injuring the bulk of the corn crop of Northern Illinois. Passing through one of the northern counties of that State soon after this frost, he saw two fields of corn adjoining each other, separated only by a two year old hedge, the one dead by the bite of the frost, the other grew as in midsummer. The soil was similar, the elevation the same, but the effect of the frost very unlike on the two pieces. Inquiry resulted in learning that the field on which the corn stood green and growing, had been under-drained with the mole-plow the spring previous—that was all the difference in the treatment of the soil and the crops. It was certainly a marked difference, and a remarkable illustration of the effect of drainage upon temperature.

Mr. Thomas, of Wayne, had let his ditching by the job, and got it done at five to seven and a half cents per rod, two and a half feet deep. The soil was clay. He could get it done at the same cost by the day's work.

Thus ended the discussion. The weight of the testimony was in favor of the profit of draining. But the fact was also developed that it required great care and judgment to succeed in it at first—that it was essential that the drainer should have a thorough conception of what he was going to do, and understand how to do it

A. B. Conger, chairman, briefly summed up the leading points reached by last evening's discussion on under-draining. The subject for the present evening was

Fences and the Cattle Law of New York.

T. C. Peters opened the discussion. He had obtained the statistics he was about to present, during four years' extensive travel throughout the State. He alluded to the great importance of providing fencing for the future—old fences were decaying, and new ones would be needed, and we should have to adopt more nearly the practice of European countries. He assumed a mile of highway to each square mile of land—which is probably far within bounds. There are 28 million acres of land; of this about 16 millions are improved, and 10 millions unimproved; the remaining 2 millions probably is villages, &c., according to several authorities cited. According to his estimate there were about 28,000 miles of highway in the State, or 56,000 miles of road fence. The cost of road fence he placed at a dollar a rod; the capital required to keep up the fence, another dollar at interest. The total annual cost of keeping up road fences is over two million dollars, or nearly one-half the entire State tax.

The average size of farms over the whole State is estimated carefully at 100 acres each; these, fenced in 10 acre lots, require 800 rods of fence on each farm, besides the cost of the waste land. The whole cost of all fences in the State, he figured at $144,000,000. The annual interest on the fences on each farm is $56; or $28,000,000 are to be charged to the farmers of this State to keep up the fences annually. Yet all the taxes paid by *farmers* is only 33 cents per acre—the cities paying a large portion—yet the annual tax that fences occasion is *one dollar and twelve and a half cents per acre!*

A member present stated that he had made a careful estimate of the roads of the State from Smith's large new map, which gives every public highway, accurately laid down, and he made the amount about twice as great, or 60,000 miles, requiring 120,000 miles of highway fence.

The Chairman (A. B. Conger), in reply to an inquiry, said that the public had only the *right of way* on the land owned by private individuals, who really owned the land thus occupied. He then explained the present road law for the exclusion of cattle from the highway.

L. F. Allen thought that while in some districts, where there are substantial God-fearing farmers, this law might, by some mutual agreement, be carried out; yet, throughout most of the State, he believed it would be as much of a dead letter as the law against traveling on the Sabbath; and he mentioned some instances where "irresponsible vagabonds" had annoyed

their better neighbors by taking advantage of this law; and the latter feared the threats of these vagabonds, should they enforce the law. He regards the present necessity of farmers to fence against intruders as a most formidable evil, but he hardly knew how to furnish a remedy.

Dr. Thompson, of Aurora, described the efforts of his neighbors in procuring the enactment of a special law to exclude cattle from the streets of his village, which, with the determination of a number of land-owners, they had carried out, and entirely excluded cattle and other animals. Their highways had become smooth grass plots, and now, after the lapse of several years, it had become unnecessary to use gates, and many of them had been removed from their hinges. So well pleased had the neighboring farmers become with these results, that the past winter they had asked for a similar town law; and this had led to the enactment of the State law now in force. They had, in fact, received in this way much more than they asked for.

Solon Robinson said a correspondent had proposed an amendment of that law, by which it should become the duty of the pathmaster to enforce the law and exclude the cattle, as a part of his duty in keeping the road in order. L. F. Allen replied by asking, "Who made the pathmaster? Is it not the very men who, owning little or no land themselves, claim the privilege of breaking that law, by turning their unruly animals into it—would pathmasters thus manufactured be likely to enforce it?"

T. C. Peters said he thought the law much more generally enforced than Mr. Allen was aware of. He cited instances where years ago men had raised a cow and a horse, &c., in the road. They were cured of this practice by his leaving his road fences low on purpose, and then notifying them that the law would be rigidly enforced if the cattle intruded in the fields. The result after some litigation, was successful; and as he was willing that they should procure the feed if they would take care of the cattle, they had as a consequence become scrupulously careful of his interests, by asking the privilege to keep his fences up for the sake of the feed. Under the *new* law he had succeeded in having it carried out, by promptness and energy, and by fearlessness of any threats. It was only in those neighborhoods where the inhabitants lacked back-bone that the law was trodden under foot—where these owners of depredators perceived that their threats produced an effect. He thought it ought to be made the duty of pathmasters to enforce the law, and a fine be annexed to its neglect, so that they would have a sufficient excuse for doing their duty. He stated, in answer to a question, that there was no law to compel farmers to fence the highway.

Judge Warner stated a serious defect in the present law, in not providing for the payment of damages which cattle might commit in breaking into fields or inclosures. The officer should have power to assess damages on the sale of the cattle.

A member (name not heard) thought the law would never be enforced until street fences were removed, and he thought, perhaps, the Society should take some action with this view. Another member expressed his surprise that the gentleman from Erie, (L. F. Allen,) "who was six feet

four or five inches high," should have any fear, as he expressed, of the threats of any one.

D. M. Clark, of Allegany, said there were many in his county that had formerly been in the practice of street pasturing—one who owned 20 head, who had turned them into the road and hired out his pasture, had been induced to conform to the requisitions of the new law, and it has generally been carried out.

E. Cornell, President of the Society, stated some of his observations when in Europe. He had gone abroad favorably impressed with *live fences*, but had returned with a different opinion—he regarded them as a very expensive fence, although they might be the best that could be introduced on the western prairies. In traveling through France, no fences were to be seen—cattle were sometimes observed feeding tied by a halter, but generally they were kept up. In France there were not enough fences to suit our wants; in England they had too much. In England premiums had been offered for the most successful eradication of hedges. The President had concluded that he had too much fencing on his own farm—he intended to reduce it one-half, and make his fields larger. In England the hedge evidently destroys the value of the land for several feet on each side, by the exhaustion of the roots, and the necessary trimming is expensive. He is satisfied that in this State we have a great deal more fence than is necessary, but he would recommend a gradual reduction in this respect.

T. C. Peters moved that the Society approve of the present road law—that it meets the view of the State Agricultural Society—and that it recommend and urge its enforcement. Carried nearly unanimously.

Col. Johnson, Secretary of the Society, was requested to state some of his observations in Europe, more particularly in relation to the great exhibition of the World's Fair. He said that notwithstanding the refusal of the American government to appropriate anything for facilitating the exhibition of American productions, every courtesy was accorded to American exhibitors that could be asked. When the juries, which were composed of the most intelligent men of all nations, declared the awards, all were astonished that out of only ninety-five American exhibitors eighty-three of them received eighty-eight prizes. As a proof of the immense extent of the exhibition, he stated that twenty-six acres—nine acres more than the great exhibition of 1851—were densely filled with the choicest productions and objects. This exhibition showed a remarkable progress in eleven years. Throughout nearly every part of it indications were distinctly visible that American inventions, as shown in 1851, had been extensively diffused, modified and adopted there. He mentioned a number of exceedingly interesting instances to show this result, and showed conclusively the most important results that would have been derived from a little governmental aid. Col. J. said he was astonished to perceive the wonderful advancement in English agriculture within the last ten years, and it now indicated a high degree of perfection.

REPORTS AND COMMUNICATIONS.

To the Executive Committee of the New York State Agricultural Society:

Your committee appointed to investigate the claims of parties in this State to participate in the reward offered by the Legislature for successful attempts to cottonize the fiber of flax, have performed the duty assigned to them, and respectfully offer the following

REPORT.

I.—HISTORY OF THE EFFORT.

The Legislature of the State of New York in the supply bill for 1862, made an appropriation of two thousand dollars, to be expended under the direction of the State Agricultural Society, for the encouragement of those who were seeking by machinery to test the experiment of manufacturing flax cotton.

In order to promote the objects of the Legislature, the Society issued a circular inviting all who had been successful in "the preparation of flax as an economical substitute for cotton, so as to be used on cotton machinery," to present their claims to a committee of the Society thereafter to be appointed.

The only competitors for the State bounty were the Lockport flax cotton company, Mr. Charles Keep, agent, and Mr. C. Beach, of Penn Yan. Whereupon the Executive Committee appointed the undersigned to make an examination of their respective methods of accomplishing the object and report the result to them.

The committee met at Lockport on the sixth day of January, where they had the pleasure of meeting Gov. E. Dyer and Mr. Albert Briggs, a committee from the Rhode Island society for the encouragement of domestic industry, which has offered a large reward for the discovery of a method for cottonizing flax, and has in other ways stimulated the inquiry, and roused public attention to its importance. We were greatly aided in our inquiries by the intelligent experience of these gentlemen.

II.—THE FLAX PLANT AND THE SOILS ADAPTED TO IT.

The flax of commerce is known to botanists as the *linum usitatissimum*, which is the typical plant of a small family known as the *linaceæ*. There are several varieties of it, but that most commonly used in this country, as well as in Europe, is the blue flowered variety.

It can be raised with more or less success on a wide range of soils and climate, but it is most profitably grown on light dry loams, with a subsoil so constituted as not to permit the water to stagnate around the roots, while it is sufficiently tenacious to prevent too rapid drainage.

We subjoin the following analysis of two soils in the district where the best flax of Belgium is grown.

By washing, 100 parts were found to consist of

	No. 1.	No. 2.
Clay	9.00	8.00
Fine sand	91.00	92.00
	100.00	100.00
By analysis, Water	3.80	1.85
Organic matters	4.48	3.25
Silicious matters	87.04	91.80
Peroxide of iron	1.96	1.16
Alumina	1.52	1.22
Carbonate of lime	0.96	0.55
Carbonate of magnesia	0.27	Trace.
Alkaline salts	0.20	0.14

The excellenee of this Belgian soil must, however, result mainly from its mechanical properties, as it is deficient in some of the most important elements which enter into the composition of the flax plant. The Belgian farmer, however, is well known to be liberal in the application of manures and skillful in their adaptation to the specific wants of soils and plants. The soil is thus supplied with any missing element by the art of the farmer.

The composition of the soils upon which the best Irish flax is raised is thus stated by Sir Robert Kane. They were light clay loams.

	No. 1.	No. 2.	No. 3.
Silicia and silicious sand	73.72	69.41	64.93
Oxide of iron	5.51	5.29	5.64
Alumina	6.65	5.70	8.97
Phosphate of iron	06	25	31
Carbonate of lime	1.09	58	1.67
Magnesia and alkalies with traces of muriatic and sulphuric acid	32	25	45
Organic matters	4.86	6.67	9.41
Water	7.57	11.48	8.73

These soils, though containing a larger proportion of the elements of flax than the Belgian, are deficient in the phosphate.

We are not aware that any fertile flax soils have ever been analyzed in America, but the following analysis of flax by Mr. Salisbury, showing the amount of the matters derived from the soil which are contained in one ton of flax, will show clearly what soils are best adapted to its growth, and the manures necessary to correct any deficiencies which may exist.

PROPORTIONS.

1. Sun dried flax	100.00	grs.
Dry	91.42	"
Water	8.58	"
Ash	1.80	"
2. Flax seed	100.00	grs.
Dry	92.72	"
Water	7.28	"
Ash	3.70	"

1. ANALYSIS OF STRAW AND FIBER.

Silica,	removed in a ton of straw				2,272	lbs.
Earthy phosphates,	"	"	"	"	7,037	"
Carbonate of lime,	"	"	"	"	7,696	"
Magnesia,	"	"	"	"	0,812	"
Potash,	"	"	"	"	7,838	"
Soda,	"	"	"	"	2,374	"
Sulphuric acid,	"	"	"	"	1,042	"
Chlorine,	"	"	"	"	0,133	"
					29,204	lbs.

2. ANALYSIS OF FLAX SEED.

Silica,	removed in every 100 lbs. of seed				0,666	lbs.
Earthy phosphates,	"	"	"	"	1,757	"
Carbonate of lime,	"	"	"	"	0,007	"
Magnesia,	"	"	"	"	0,003	"
Potash,	"	"	"	"	0,669	"
Chloride of sodium,	"	"	"	"	0,743	"
Sulphuric acid,	"	"	"	"	0,279	"
					4,124	lbs.

The manurial substance most likely to be required by the soils of this State to fit them for profitably raising flax, will be the earthy phosphates, since, if each ton of straw bears ten bushels of seed, we see from the above table that 17 lbs. of the earthy phosphates will be withdrawn from the soil by each crop.

After all, the great majority of farmers will most easily understand the kind of soil best adapted for flax raising, when they are told that soils best adapted for barley, are the best also for flax; and where maximum crops of the former are found to grow, maximum crops of the latter may be certainly calculated on.

III.—THE CULTIVATION OF FLAX.

The most essential condition for the profitable growth of flax, is good drainage, either natural or artificial. It is a waste of labor and money to sow flax seed on land where water stagnates round the roots. The next is, to plow the land deeply, and to pulverize it thoroughly. The roots of flax will, unless prevented by a hard subsoil, penetrate full half the length of the straw into the ground, and the length and size of the straw, other things being equal, will depend upon the length of the root. Hence, if the farmer fails to fulfill these conditions, he will incur a heavy penalty.

The seed should be of the growth of the preceding year—plump, heavy, glossy, of uniform size and color, of a clear brown hue. If there are many seeds of a light drab chocolate color the lot should be rejected.

The seed to be sown varies in amount, according to the quality of the soil, and the portion of the crop which is deemed most valuable. Rich soils require less seed than poor ones; and where the production of seed is the principal object of the farmer, a smaller quantity is sown than where the lint is the chief object. When the culm begins to branch, its value as flax ceases; hence, that flax straw is most valuable which has the greatest length between the root and the branches. Thin sowing increases the tendency to branch; thick sowing diminishes it. Where seed is the principal object, one bushel is sufficient to sow on very rich lands; or one and

a half bushels on poor soils. When lint is the chief object, three bushels of seed should be sown.

Weeds, which are well known to be injurious to all growing crops, are peculiarly so to flax. No pains, therefore, should be spared to purify the flax seed from all foreign admixtures, and with a view of burying the seeds which have lodged on the surface of the soil, beyond the reach of germination, the plowing should be done with a Michigan plow, which more completely inverts the surface than any other. It is also desirable that the sowing should be suspended long enough after plowing to give the seeds of any weeds which may be in the soil time to germinate; they are then to be killed by the cultivator, when the seed should be evenly sown and harrowed, once in the line of the furrows, and once angling with them so as to diffuse the seed more equably. The field is then to be rolled smooth.

Many good farmers think it is for their interest to weed the field by hand after the plants are from four to five inches high. This is done almost universally in Ireland and Belgium. Where weeding is resorted to, care should be taken by the workmen to avoid any rotation of their feet; they should be set down and taken up perpendicularly, and the weeding should be done facing the wind, which will then assist in raising the trodden-down plants. It is necessary that the land should be level, for if thrown into the ridges the straw matures unequally; it should be smooth, so that the crop can be gathered with a reaping machine.

Soon after the bolls are formed the lower leaves begin to fall off, and the straw becomes yellow from the bottom, about half its length upwards, when it should be pulled or cut with a reaping machine very close to the ground; if it is suffered to stand much longer than this the straw is materially injured. The seed is then to be separated from the straw by means of a rippling machine. It is very desirable that the seed should be *completely* separated from the straw, because if any of them are left on they are crushed in the breaking machine; and where the oil comes in contact with the fiber it is almost impossible to separate it from the *shive*.

It is very desirable that the connection between the farmer and the flax should terminate at this point, as the remaining processes can be much more beneficially conducted by others.

IV.—CAUSES WHICH HAVE HINDERED THE PRODUCTION OF FLAX.

It is certain that in many of the great barley districts of Central New York, which are also the great flax districts, no flax whatever is now grown. It is also the opinion of most intelligent farmers that its culture has been greatly diminished within the last twenty years.

Owing to the great and obvious mistakes and deficiencies in the census returns, it is difficult to verify this opinion, or to ascertain the amount of the diminution.

We think the most reliable statement contained in the census is that respecting the number of acres sown with flax, which gives 46,089 acres for 1845, and 11,764 for the year 1855. If we may rely upon this statement, there was a diminution during the decade between these years of seventy-five per cent. We think the causes of this diminished production are as follows:

1st. The want of a regular and remunerative market.

2d. It has formerly been thought necessary to pull the flax by hand, which requires more labor than most farmers are able to spare at that season of the year. This has been a very great hindrance to the growth of it; but it need not be so for the future. It is now found, that when the ground is smooth and well rolled, it may as well be cut with the reaping machine, except for the very finest fabrics. In this case a machine for pulling it has been invented, which executes the work with great rapidity and at very small expense.

3d. The retting process is very unhealthy.

4th. Few farmers understand the rationale of this process, and their practice is empirical; the result is, therefore, uncertain. Sometimes it is not carried far enough when the fibers are not separated; at others it is carried too far, when the fiber is useless, because its tenacity is destroyed.

5th. The operations of braking, scutching and hackling are dirty and disagreeable, and are therefore repulsive to farmers and their sons.

6th. Scutching and hackling can only be performed by skillful workmen, who are in all places difficult to be obtained in sufficient numbers to do any considerable amount of work; and in some places they cannot be obtained at all.

7th. There has been a growing preference for cotton instead of linen fabrics for under-clothing, and for bedding.

It will be observed that we have not enumerated the unprofitableness of the flax crop among the causes of its diminished production. Where a farmer has lands adapted to its cultivation, where he understands thoroughly all the processes from the preparation of the land to the production of the dressed fiber, and where he has an adequate supply of skilled labor and the requisite tools and fixtures, flax growing even now, is, we believe, one of the most profitable occupations of the farmer. It is because these conditions are so seldom united that the cultivation of the crop has so greatly diminished.

V.—WHAT IS NEEDED TO INCREASE THE CULTURE OF FLAX.

The one thing most needed to extend the cultivation of this most important staple, is to create a market which will insure to the farmer a steady and remunerative price for his seed, and for his straw just as it comes from the rippling machine, thus relieving him from all the processes for converting crude straw into dressed flax or flax cotton.

Since 1,500 lbs. out of every ton of straw is absolutely useless, it is obvious that the straw will not bear the expense of transportation to very great distances; if there is to be a market for the straw, there must be a *home* market. The producer and consumer must be brought side by side. Factories must be erected in the flax regions, which will strip it of its useless matters and fit it for the purposes of the manufactureer, if they do not manufacture it themselves. We learned during our visit, what we did not know before, that there were already several of these factories in operation, and that their number would be considerably increased next year, for the purpose of supplying a crude flax to the upholsterers and paper makers, the demand for these purposes being considerably in advance of the supply. But should the process for completely cottonizing flax be per-

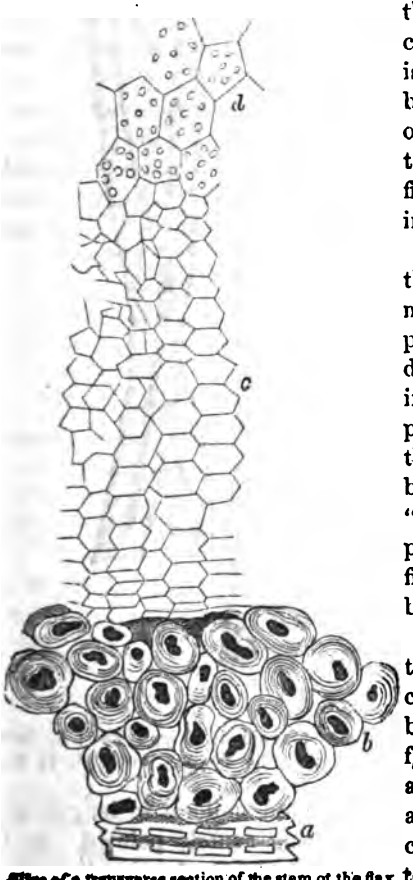
fected, the number of these factories will be vastly increased, especially in Central New York.

Such factories will surely be established whenever they are proved to be profitable. They will certainly be profitable whenever some solvent is discovered which will completely dissolve the cement and reduce the bast tissue to its *ultimate* fibers, at a cost which will enable the product to be sold at the average price of cotton.

The great problem then, is to discover this cheap solvent; it is to aid in the discovery of it that the Legislature has made its appropriation, and we hope it will continue to do so until the goal is fully reached. When it is really solved, millions of dollars will be added to the wealth of the State, of which addition the farmers will receive the lion's share. We compute from the data before us, that the value of the flax region of Central New York would be increased by at least ten dollars per acre.

VI.—THE STRUCTURE OF THE FLAX PLANT.

On examining a horizontal section of the culm of the flax plant, we find a central rod of pith; around this is wrapped a cylinder of woody fiber; this in its turn is enwrapped by a cylinder of bast tissue, and this again is inclosed in an exterior cylinder of bark or epidermis. The appearance of such a section, when magnified 400 times, is well shown in the annexed figure, copied from Prof. Hodge's report in the "Practical Mechanics' Journal:"



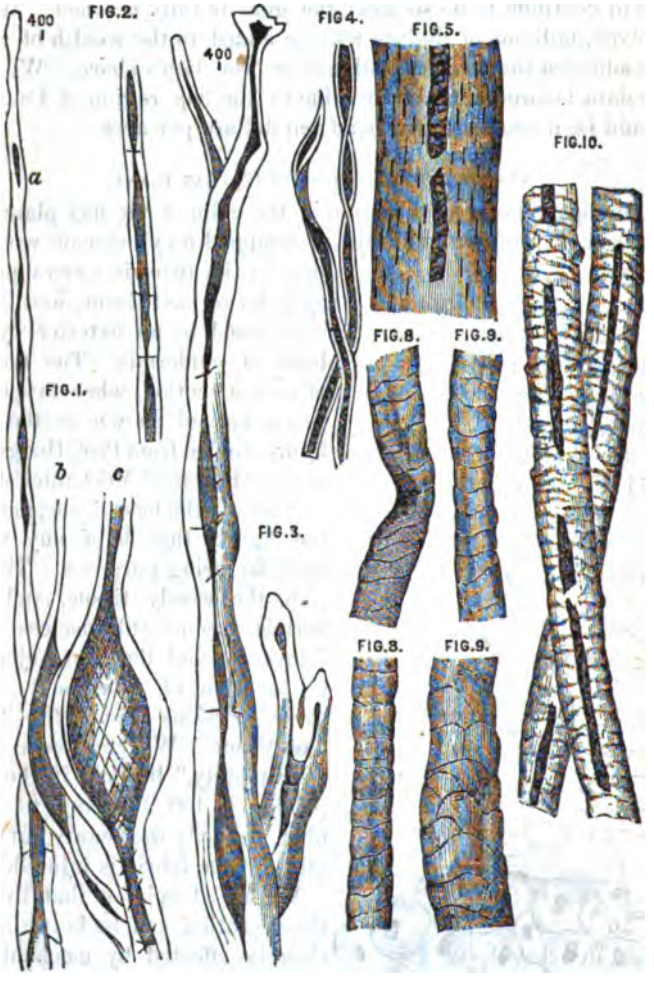
Slice of a transverse section of the stem of the flax plant, magnified 400 times its natural size. *a*, epidermis; *b*, liber fibers; *c*, woody tissue; *d*, pith cells.

It is only the bast tissue, marked *b* in the figure, that is of any value for manufacturing purposes. The central pith, the woody tissue, and the epidermis are not only useless but very injurious, and the first object in the preparation of flax, is to separate these portions *completely* from the bast tissue. We emphasize the word "completely," because if the smallest portion is left adhering to the bast fiber, not only the beauty but the durability of the fabric is injured.

We are of opinion that this part of the operation can be better and more cheaply effected by mechanical than by any other means. A very gratifying degree of success has already attended the efforts in this direction, and it seems to us that the application of some obvious improvement to existing methods will accomplish all that can be desired in this respect.

VII.—STRUCTURE OF THE BAST FIBER.

After the bast tissue has been thoroughly freed from foreign matters, much remains to be done before it is reduced to its ultimate fibers, and this reduction is by far the most difficult part of the process. This tissue consists of ultimate fibers, very nearly equal in length and in diameter; at least, they are quite as nearly so as those of cotton. The annexed figures from "*Die Pflanzenzelle*," by Dr. Hermann Schlacht, will convey a clear idea of the microscopic appearance of the ultimate fibers of flax, and several other of our more important textile fabrics.



Fibers of flax, hemp, jute, cotton wool and alpaca magnified. Fig. 1, flax; 2, jute; 3, hemp; 4, cotton; 5, coarse long wool. Figs. 6, 7, fine Saxony wool; 8, 9, fine English wool; 10, alpaca.

The fibers of flax are, as we have already said, uniform in length and diameter, and fusiform in shape, the ends being acutely pointed. It is essential that these characters should be preserved, in order that they may be spun successfully on cotton machinery. The process of Claussen for

making flax cotton, which at one time was in such high favor, failed of success, because he attempted to obtain uniformity in the length of the fiber, by cutting, instead of separation; the stumpy ends thus formed were fatal to the success of his enterprise.

The fibers of the bast tissue are connected together by a strong adhesive nitrogenous cement, which has a very strong affinity for them. We believe that all attempts to overcome this connection by mechanical means must necessarily result in failure; such efforts are as absurd as to extract grease from cloth by mechanical means. The only means of separating them is to discover some solvent which has a stronger affinity for the cement than the fibres of the flax. Whoever shall be the first to discover such a solvent may exclaim with Archimedes, Eureka! An ample reward in fame and in money awaits the discoverer, whoever he may be.

We have been thus particular in our statements because we have had reason to believe that much misconception exists in the minds of many of those who are experimenting with a view of producing flax cotton. They have not clearly discerned that this involves two distinct and dissimilar operations, viz: the *mechanical* separation of the cortical and woody tissues from the bast, and the *chemical* solution of the cement in the latter tissue with a view to the separation of its ultimate fibers. Some of them are spending much money and time in vain efforts to effect both objects by machinery. Others are wasting time and money in equally vain endeavors to effect both objects by chemical processes. We think that our chances for a successful solution of the problem will be greatly increased when all parties are brought to clearly recognize the fact that these two objects cannot be obtained by the same, but by widely different methods.

VIII.—THE LOCKPORT PROCESSES FOR COTTONIZING FLAX.

The Lockport flax cotton company was incorporated in 1862, with a capital of $10,000, divided into two hundred shares of fifty dollars each. It was subsequently increased to $15,000, which, with $10,000 more, has been expended in machinery and fixtures. Their mode of operating is as follows:.

I. *The braking process.* The dried straw, as it comes from the farmer, is laid in thin sheets upon an endless apron which conveys it forward to the machine, which consists of seven pairs of top and bottom fluted rollers, following each other successively, the first pair being eight inches in diameter, with a pitch of two inches; the last five inches in diameter, with a pitch of three-eighths of an inch. They are so geered that the last pair move with twelve times the velocity of the first pair. Each pair of rollers is held in contact by the action of screws and powerful India rubber springs. The bottom rolls are driven by geers, and the top are driven by friction from those below.

The passage of the straw between these rollers produces the following results:

1st. The round culm is flattened by their pressure.

2d. By this flattening the woody and cortical portions are split lengthwise into narrow portions.

3d. By the fluting of the rollers these portions are broken crosswise.

4th. By the draft of the rollers the bast tissue is, to some extent, torn asunder, and a portion of broken *shive* or *boon*, as the woody and cortical portions are termed, are detached and fall down beneath the machine. By this process about thirty per cent. of weight is lost.

II. *The dusting process.* This is effected by passing the lint, as it comes from the braking machine, through two rapidly revolving cylinders, armed with spike teeth, similar to an ordinary thrashing machine, or "willow" of the cotton manufacturers. By this operation,

1st. Another portion of *shive* is detached from the bast tissue.

2d. This tissue is still more split up. Thirty per cent. of weight is lost by the dusting operation.

III. *The scutching process.* This machine had not arrived when we were at Lockport, having been detained on the railroad. It is intended by this machine to separate a still further portion of *shive;* it is expected to take out about six per cent. of the lint which is passed through it.

IV. *The second dusting.* Which takes out about one per cent. more.

V. *The combing process.* This operation is too complicated to be described without reference to a diagram. Those who are familiar with old worsted combing machines will have no difficulty in understanding it, as it is exactly similar in principle; this effects three objects:

1st. It detaches about one per cent. of shive.

2d. It lays the fibers parallel to each other, and gives them a slight twist.

3d. It separates the longer from the shorter staples to some extent.

VI. *The steep.* The combed flax is steeped in tepid water for twenty-four hours.

VII. *Boiling.* It is now boiled in soap-suds and soda ley for twelve hours.

VIII. *Washing.* Water is poured on to the fiber and thrown off centrifugally by means of a hydro extractor.

IX. *Bleaching.* First, steeped in a solution of chloride of lime; second, washing; third, squeezing; fourth, steeped in dilute sulphuric acid; fifth, washing.

X. *Solvent process.* Dipped in a solution of alum, borax and salt.

XI. *Washing.* In water, holding a little sal soda in solution.

XII. *Drying.* By exposure to a current of warm air, which has been warmed by passing over steam pipes.

XIII. *Scutching.* As in third process.

XIV. *Lapping.* On an ordinary lapping machine.

XV. *Carding.* There are eight carding engines, each of which turns off about one hundred lbs. per day. From the cards a railway head conducts it to the drawing frames, which are like the ordinary ones, except that the top rolls are of iron, or steel, and fluted like the bottom rolls.

IX.—ESTIMATE OF THE EXPENSE OF THE LOCKPORT PRICES PER TON.

Straw	$10 00
Braking	1 00
Dusting	50
Carding	75
Scutching	75
Second dusting	50
Combing	1 00
Washing	50

Chlorine	$6 00
Washing	50
Acid	45
Washing	50
Drying	1 00
Lapping	75
Salting	1 00
Washing	50
Carding	1 00
Drawing	50
Total	$27 20

We have not verified these estimates, which are exclusive of rent, interest, fuel, insurance, taxes, repairs and cost of superintendence; they are just as we received them from the company.

The product of one ton of straw is about three hundred lbs. of flax cotton, and three hundred lbs. of lint suitable for mixing with wool.

You will be furnished with specimens of the product after each operation, and can, therefore, judge for yourselves of the result.

X.—THE PENN YAN PROCESS.

The crude straw is thrown upon an iron disk, four feet in diameter, which is made to revolve forty-five times in a minute. Two wooden cylinders, eighteen inches in diameter and twelve inches long, roll upon each end of one of the diameters of the disk; they are powerfully pressed upon it by means of screws and India rubber springs. The fiber is carried under these rollers by strongly curved hooks, placed on the face of the rotary disk, grooves being cut in the rollers to permit their passage.

On the diameter, at right angles to the crushing rollers, are two beating cylinders, 8 inches in diameter, armed with teeth 3 inches long, which revolve 1,200 times in a minute. The straw is first cut into lengths meant to correspond to the length of staple desired, and is dropped into the machine from above. This cutting process we think objectionable, as it leaves stubbed ends to the fiber. This Mr. Beach hopes to overcome by the use of saws in a cutting box, which was not in operation when we saw it, nor do we think the results will prove satisfactory. The result of this operation is, that each particle of lint is alternately crushed and beaten 90 times in a minute. Each charge is acted upon 15 minutes, and the portions of shive detached are thrown out through a wire screen at the side of the machine.

The lint is now removed to another machine, where it is placed on an endless apron which carries it forward to a pair of fluted rollers. It is seized by these and brought into contact with a cylinder, the lags on which are 3 inches wide, and are covered with leather, through which tacks have been driven. The openings between the lags are 2 inches wide, through which a powerful current of air from a fan is directed on the fibers which have been caught on the tacks from the feeding rollers, and which detaches a portion of the *shive*. The fiber is then thrown from the tacks on the opposite side of the cylinder, by the current, on to an endless wire apron, which carries it to the front of the machine, where it is detached by a brush cylinder. This completes the process so far as we saw it, though Mr. Beach

is devising additional means not yet completed. A specimen of the product will be forwarded for your inspection.

XI.—OPINION OF THE COMMITTEE.

The Executive Committee of the Society having reserved to itself the distribution of the bounty of the State among the various claimants, our duty would seem to end when we have faithfully observed the facts, and truthfully reported them; yet as we have been informed that our opinions would be acceptable, we state frankly that we do not think that either of the parties have produced flax cotton in such a form as to be spun upon cotton machinery. In the best specimens of the Lockport flax cotton you will find particles of *shive* adhering; the fibers are irregular in length and in diameter, and by careful manipulation you will find that almost every fiber can be farther divided, which shows that the cement is imperfectly dissolved.

The lint made by Mr. Beach at Penn Yan contains more of the *shive*, and the fibers are less minutely divided than in that made by the Lockport company. As it was produced in our presence, we should hardly suppose that it could have been operated on by cotton machinery; but Mr. Beach showed us samples of roving and yarn made from the mixture, as he assures us, on cotton machinery.

We are fully convinced that the reduction of flax fiber to flax cotton is PRACTICABLE. Already great strides towards the accomplishment of this has been made, as we think, in the right direction. We feel confident that nothing is needed but intelligent and persevering efforts, to achieve a triumphant success.

We deem it desirable in the highest degree that the Legislature should continue to offer a reward with a view of stimulating and encouraging the activity and ingenuity of inventors. In case such appropriations are continued, we would respectfully suggest that the object should be made more specific, as 1st. —— dollars to any person who within the year 1863 shall bring into operation the greatest mechanical improvement for separating the "*shive*" or "*boon*" from the bast tissue of flax. 2d. —— dollars to any person who within the year 1863 shall discover the most perfect solvent for the separation of the bast tissue into its ultimate fiber. To be awarded by the State Agricultural Society.

XII.—SUGGESTIONS.

It is very obvious that the woody and cortical tissues can be broken and detached much more easily when in a dry than in a damp state. It therefore seems to us that sufficient care is not taken to insure the perfect dryness of the straw before braking.

We are of opinion that more care should be taken to separate *all* the shove from the fiber before resorting to chemical agencies. We think the bleaching of the fiber is quite an unnecessary expense if it does not aid in the separation of the fibers, *i. e.*, we do not think bleaching necessary with a view to the whitening of it.

It seems to us that our experimentalists have too much neglected Mr. Schenck's method of steeping the flax in warm water at ninety degrees,

with Mr. Pownall's improvements in exposing the steeped straw to the pressure of a pair of smooth iron cylinders, while at the same time a stream of water is made to flow upon the rollers, so as to wash away the softened organic matters which adhere to it.

These suggestions may be of little value, but as we all concur in them it may do no hurt to offer them to the consideration of those who are seeking to solve the mystery of flax cotton.

If the Executive Committee should adopt the principle of giving any portion of the bounty of the State to meritorious, though unsuccessful competitors, we think such portion would be worthily bestowed on Mr. Beach. He has been for many years engaged in the enterprise, upon which he has expended much labor, time and money, without any return whatever.

The Lockport company have already succeeded so far as to make a fiber practically useful, to an extent which we think will prove highly remunerative to them. They have cheerfully afforded, at all times, such information as they have acquired, to all comers; they have contracted with as many farmers of Niagara county as desired to do so, for their crops of flax straw at ten dollars per ton, and by their enterprise have made a home market for farmers which will prove of great value to them. Such enterprise and such results, are in our opinion well worthy of public encouragement and reward.

It may be interesting to many farmers to learn that the average crop in Niagara county last year was one ton of straw and fourteen bushels of seed to the acre.

All of which is respectfully submitted.

SAMUEL CAMPBELL,
JOHN STANTON GOULD,
ALFRED WILD,
Committee.

South Downs and Hampshire Downs.

The committee on middle wooled sheep would respectfully report: That the show in this department exceeds in number and uniform excellence that of any previous fair of the Society. The merits of many of the different pens are so nearly equal as to render the task of the judges one of great difficulty and delicacy. They would desire to deprecate the practice of some exhibitors in so shearing as to present to the eye a perfect model of a sheep, rendering it absolutely necessary to decide the merits of the animal solely by handling, without regard to appearance. This was more particularly noticeable in the coarser breeds.

Your committee would also recommend the propriety of again subdividing the Downs, and offering separate premiums on the Shropshire and Hampshire breeds, which would lessen greatly the labor of the judges, and add much to the satisfaction of the exhibitors.

H. T. E. FOSTER.
J. M. ROCKWELL.
T. C. PETERS.

The committee would recommend discretionary premiums to be awarded to Messrs. Parsons & Meek for Hampshire bucks of two years old; the animals exhibited by these gentlemen being, in the opinion of the committee, well worthy of the same. (This recommendation was adopted by the Executive Committee, and separate premiums were awarded.)

Premiums on Fleeces of Fine Wool at State Fair.

The report of the committee on best twenty fleeces of fine wool, awarding the first and second premiums to George Brown, of Phelps, Ontario county, was not received until after the list of premiums was published.

The committee report that the fleeces (forty in number) were very superior in quality and condition, and were accompanied by the statements as to feeding, &c., and Mr. Brown is entitled to the first and second premiums.

FIRST PREMIUM.

Ontario county, ss: George Brown, of the town of Phelps, in said county, being duly sworn, doth depose and say that the statements hereto annexed are in all respects true.

Sworn to before me this 3d day of November, 1862.

John Whitwell, *Justice of the Peace.*

Statement.

The sheep from which the above fleeces were shorn was kept in the following manner: From about December 10th until January 10th, fed morning and night with cut cornstalks, with an occasional change to hay—say once a week; at noon with straw, and one peck of oats and corn to the one hundred sheep from January 10th until about May 10th; the same as above, with the addition of two bushels mangel wurzel to the one hundred sheep; the sheep pastured the rest of the season. GEORGE BROWN.

Ewe four years old; raised a lamb; weighed before shearing ninety lbs.; weight of fleece four and a half lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing eighty-one lbs.; weight of fleece five lbs. ten oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe five years old; raised a lamb; weighed before shearing forty-seven lbs.; weight of fleece four lbs. one oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing sixty-eight lbs.; weight of fleece four and three-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing sixty-nine lbs.; weight of fleece three and three-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing seventy-seven lbs.; weight of fleece four and a half lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing eighty-one

lbs.; weight of fleece five lbs. two oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing ninety-two lbs.; weight of fleece five lbs. one oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing seventy-three lbs.; weight of fleece five and a quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing forty-five lbs.; weight of fleece three and three-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing eighty-nine lbs.; weight of fleece four and three-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe two years old; weighed before shearing sixty-five lbs.; weight of fleece four lbs. three oz.; growth of wool one year less one day; sheep fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing sixty-seven lbs.; weight of fleece three and three-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing seventy lbs.; weight of fleece four and one-quarter lbs.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe five years old; raised a lamb; weighed before shearing seventy-three lbs.; weight of fleece four lbs. six oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing seventy lbs.; weight of fleece four lbs. two oz.; growth of wool one year less one day; sheep was fairly shorn at previous shearing.

Ewe seven years old; raised a lamb; weighed before shearing sixty-eight lbs.; weight of fleece four and a half lbs.; growth of wool one year less one day; sheep fairly shorn at previous shearing.

Ewe two years old; weighed before shearing sixty-nine lbs.; weight of fleece five lbs. five oz.; growth of wool one year less one day; sheep fairly shorn at previous shearing.

Ewe two years old; weighed before shearing eighty-four lbs.; weight of fleece four lbs. and three-quarters; growth of wool one year less one day; sheep fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing eighty lbs.; weight of fleece five and a half lbs.; growth of wool one year less one day; sheep fairly shorn at previous shearing.

Ewe four years old; raised a lamb; weighed before shearing seventy-five lbs.; weight of fleece four and a quarter lbs.; growth of wool one year less one day; the sheep was fairly shorn at previous shearing.

SECOND PREMIUM.

Statement of keeping.

The sheep from which the following fleeces were shorn, was kept and fed as follows: From about December 10th until January 10th fed with hay

night and morning; at noon with straw and one half bushel of shorts and oats to the one hundred sheep; from January 10th until about May 10th fed the same as above, with the addition of one and a half bushels of mangel wurzel; housed during the time; pastured the rest of the season.

Ewe thirteen months old; weighed before shearing forty-nine lbs.; weight of fleece four lbs. five oz.

Ewe thirteen months old; weighed before shearing forty-nine lbs.; weight of fleece four lbs. fifteen ounces.

Ewe thirteen months old; weighed before shearing fifty-seven lbs.; weight of fleece four and a half lbs.

Ewe thirteen months old; weighed before shearing sixty lbs.; weight of fleece four lbs. ten ounces.

Ewe thirteen months old; weighed before shearing fifty-seven lbs.; weight of fleece four and a quarter lbs.

Ewe thirteen months old; weighed before shearing fifty-two lbs.; weight of fleece four lbs. five oz.

Ewe thirteen months old; weighed before shearing sixty-nine lbs.; weight of fleece four and a quarter lbs.

Ewe thirteen months old; weighed before shearing fifty-five lbs.; weight of fleece five lbs. six oz.

Ewe thirteen months old; weighed before shearing forty-nine lbs.; weight of fleece four lbs. two oz.

Ewe thirteen months old; weighed before shearing forty-nine lbs.; weight of fleece four lbs. one oz.

Ewe four years old; raised a lamb; weighed before shearing eighty lbs.; weight of fleece four lbs. five oz.; growth of wool one year less one day; the sheep was fairly shorn at previous shearing.

Ewe three years old; raised a lamb; weighed before shearing eighty lbs.; weight of fleece five lbs. two oz.; growth of wool one year less one day; the sheep was fairly shorn at previous shearing.

Ewe thirteen months old; weighed before shearing forty-four lbs.; weight of fleece four lbs.

Ewe thirteen months old; weighed before shearing fifty-seven lbs.; weight of fleece four lbs. one oz.

Ewe thirteen months old; weighed before shearing forty-two lbs.; weight of fleece three lbs. and three-quarters.

Ewe thirteen months old; weighed before shearing fifty-two lbs.; weight of fleece four lbs.

Ewe thirteen months old; weighed before shearing fifty-eight lbs.; weight of fleece four lbs. thirteen ounces.

Ewe thirteen months old; weighed before shearing forty-seven lbs.; weight of fleece four lbs.

Ewe thirteen months old; weighed before shearing sixty-five lbs.; weight of fleece five lbs. two oz.

STATISTICS OF HON. ZADOCK PRATT'S DAIRY FARM OF 365 ACRES, AT PRATTSVILLE, GREENE COUNTY, N. Y., FOR THE YEAR 1862.

Hon. B. P. JOHNSON, *Secretary of New York State Agricultural Society:*

Sixty-four cows, of what are called native bred, from fourteen months to fourteen years of age, being the average number kept for the usual season of about eight months.

MILK.

	In lbs.	In gallons.
Whole product	282,353	35,740
Average per cow	4,411	558.43
Average per day	1,085	137.4
Average per day for each	16.9	2.4
Greatest average in one day per cow	25.3	3.2

BUTTER.

Whole product	14,274	
Average per cow	223	
Average per day	54.9	
Average per day for each cow	13.71 ozs.	
Average milk to 1 lb. of butter	19.7 lbs.	10.001 qts.

PORK.

Amount made in pounds	9,318
Amount made to each cow	144

Two hogs under 2½ years old, one weighing 723 lbs., and the other 670 lbs.

SALES.

Butter sold	$3,711 24
Pork "	465 90
Calves "	50 00
Poultry "	80 15
Deacon skins	16 40
	$4,323 69
Expenses for working farm over proceeds of same, not enumerated above, including $700 for interest on investment for farm and stock, $10,000	1,526 77
Net profits	$2,796 92
Amount realized from each cow from pork	$7 28
Amount realized from each cow from butter	57 98
Total	$65 26

OTHER PRODUCTS.

800 bushels of corn in the ear, from 8.1 acres.
300 " oats—about 45 bushels to the acre.
1,600 " carrots, } from about 2 acres.
200 " turnips, }
50 " buckwheat—short crop.
40 tons of hay—2½ tons to an acre.
20 hives of Bees.

Increase in stock, value	$25
Honey sold	25

RELATIVE WEIGHT AND STRENGTH OF MILK.

	1860.		1861.		1862.	
	Qts. to 1 lb. butter.	Weight per gal.	Qts. to 1 lb. butter.	Weight per gal.	Qts to 1 lb. butter.	Weight per gal.
May 1	12.96	7.91	11.20	8.62	9.80	7.60
June 1	11.48	8.28	12.40	7.74	10.77	7.84
July 1	12.14	8.30	10.74	8.03	10.55	7.80
August 1	11.35	8.66	10.45	8.28	10.13	7.88
September 1	11.83	8.09	9.94	8.12	9.13	7.80
October 1	9.28	8.68	8.85	8.07	7.00	7.68
November 1	8.21	7.56	8.50	8.12	7.58	7.44
Average of whole season,	11.20	8.28	10.42	8.05	10.01	7.90

Having formerly made a report for five successive years, and having explained in those reports the system of making butter, I will omit it in this.

This season (1862) was not as good for corn as usual. Two acres were sown broadcast, expressly for fodder for the cows; this, when fed to them as in former years, did not increase the quantity of milk as it had heretofore done: The corn stalks from eight acres was not as closely eaten up as in previous years, nor were they of half the value; and the corn, also, proved to be of an inferior quality—not more than three-quarters as good. With the same cultivation, and on the same kind of land, I find that in 1860 it yielded 64 bushels to the acre; in 1861, 56 bushels, and this year, less than 50 bushels.

Last year, the stalks from sowed corn, when fed to the cows, increased their milk, but when fed on pumpkins, did not. But this year the reverse is the case; the sowed corn did not increase the quantity of milk—but, singular as it may be, (to me unaccountable,) when fed on pumpkins, did—the season being about as usual.

By sowing timothy and white clover on old pastures, early in the spring,—without dragging,—I find an extra increase. It seems to renew the quantity and quality of the feed.

Last season I planted 150 sweet apple trees, for the purpose of feeding the fruit to the cattle and hogs, and during the winter the mice destroyed 30 of them. I have now placed tin pipe, 12 inches long, around each tree, in order to keep these pests of the farm from destroying more; though stamping the first snow solid around the tree, will answer the same purpose.

I have this season sowed a bushel and a half of Guinea corn, which I brought from Nassau, N. P., thinking it might do to cut in August, as food for the cows; but it was a total failure. It did not grow worth cutting; though a farmer on that island, said it was very excellent there for making cows yield milk.

One other improvement I think we have made—drawing about 50 loads of coarse manure in the rear of the hog-pen, and putting on, through the season, the liquid from the hog-vat, to be ready for corn in the spring.

During the past season there has been an uncommon scarcity of birds and squirrels, and but very few grasshoppers.

All of which is respectfully submitted.

I am yours truly,

Z. PRATT.

MR. LIVINGSTON'S MERINO SHEEP.

CORTLAND VILLAGE, N. Y. *January* 15, 1863.

COL. B. P. JOHNSON,

Corresponding Secretary N. Y. State Agricultural Society.

DEAR SIR: In the paper on "fine wool husbandry," read by me before the State Agricultural Society in 1862,* I gave some account of Hon. Robert R. Livingston's importation of Merino sheep into the United States, and of their average weight of fleece, sales, etc., down to and including the year 1809. This is the latest date, so far as I know, to which any of his published statements on these subjects extend.

A few months since a friend in Philadelphia forwarded me the original manuscript draft of a letter written by Mr. Livingston to Col. Barclay, in England, giving the same particulars in regard to his flock in 1810. I inclose you a copy, with the request that you will embody it in the Transactions of the Society the current year, both for its own value and out of respect to one of the most intelligent, public spirited, and useful friends of agriculture who ever belonged to this State.

Very truly yours,

HENRY S. RANDALL.

July, 1810.

DEAR SIR: I promised to send you larger samples of wool than I could before furnish, together with an account of my sheep shearing. The first accompany this letter.

The circumstances worthy of note in my sheep shearing are the following. First, the general improvement of my flock since last year. The whole Merino and mixed sheep, when together, to wit, 200 ewes, gave an average of six ounces more than they did last year. The full blood ewes gave an average of eleven ounces more, without any difference in their keeping. This I attribute to an improvement in the stock, since there was no change in the old ewes, but the whole gain was upon the young ewes. Had half blood ewes been withdrawn and the average taken only on the other half, it would have amounted to about seven pounds, free from tags, though all these ewes had lambs, and I have no doubt, therefore, that when my number shall be sufficient to enable me to select my ewes, as I have my rams, that I shall make the general average of the flock at least seven pounds, and greatly improve the quality of the fleeces.

Stock rams.	Weight.	Wt. of fleece.	
One 6 years old....	146 lbs.	9 lbs.	Imported from Rambouillet.
One 2 years old....	146 lbs.	9 lbs.	Raised here.
One 1 year old....	145 lbs.	11 lbs. 11 oz.	Raised here.

* Published in Transactions of 1861, pp. 663-784.—[CORR. SEC.

Ewes.	Average wt. of fleece.	Heaviest fleece.
Common 268	3 lbs. 10 oz.	
Half blood, or 1st cross	5 lbs. 1 oz.	
Three-fourths, or 2d cross	5 lbs. 3 oz.	8 lbs.
Seven-eighths, or 3d cross	5 lbs. 6 oz.	8 lbs. 4 oz.
Full blood	5 lbs. 13 oz.	8 lbs. 12 oz.

PRICE AT WHICH THE WOOL SOLD.

Half blood, or 1st cross	$0 75
Three-fourth blood, or 2d cross	1 25
Seven-eighth blood, or 3d cross	1 50
Full blood	2 00

All sold unwashed. That your friends may see that we are not totally void of the spirit of enterprise in the United States, I subjoin the price at which my lambs sold.

4 full bred ram lambs	$4,000
14 fifteen-sixteenths ram lambs	3,500
20 seven-eighths ram lambs	2,000
30 three-fourths ram lambs	900

These were all I chose to sell, as I am extending my own flock, and, therefore, parted with no ewes, and reserved nine full blood rams for my own use. My half-bred lambs having come late were not yet exposed to sale; a few, however, have been since sold at $12.50 each. The ewe lambs of the low grades are considered as of twice the value of the rams. Had these lambs been a year old, so as to be fit for covering this season, they would have sold fifty per cent. higher. $500 was offered and refused for a fifteen-sixteenths. I sold last year at $125. My sheep shearing was attended by upwards of two hundred respectable gentlemen farmers from this and the neighboring states, and all the fleeces were weighed, as shorn, in their presence.

From the ardor which my countrymen manifest in this pursuit, I doubt not that fine wool will be a great article of export from the Northern States, if the injustice and mad policy of the manufacturing nations of Europe do not compel us to work it up at home. I am, therefore, solicitous to hear at what price the several grades of wool herewith sent are valued in England. It is certain that none of the sheep which have been of late imported into the United States from Spain, of which there are many, bear any proportion to mine, either in the weight or quality of the fleeces, besides being very inferior to them in the beauty of their forms, in which, indeed, none excel those of Rambouillet.

Your friend, Mr. Barclay, or some of the members of the Bath society, may perhaps have an anxiety to see the state of agriculture with us, and may therefore read with some interest the proceedings of our society for useful arts, though they cannot hope to learn much from it. I take the liberty to transmit them to you, desiring you to present them to him with my respectful compliments, and pray him to accept them as a small return for the pleasure I have received in reading such of the proceedings of the Bath Society as have reached us.

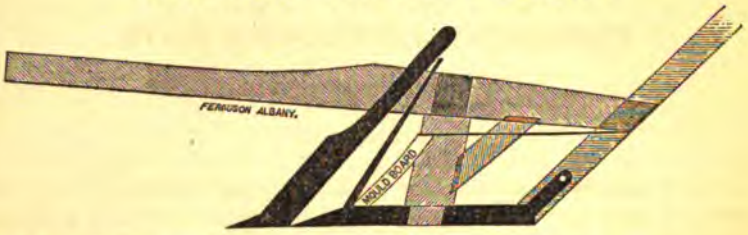
With esteem, dear sir,

Your most obedient, humble servant,

ROBERT R. LIVINGSTON.

The Honorable Col. Barclay.

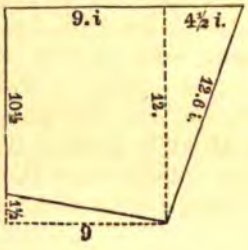
MR. JEFFERSON'S PLOW.



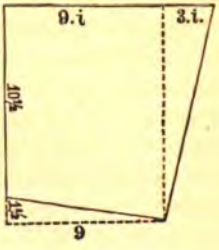
Scale, ¾ in. to the foot, or 1 to 16.
Beam, 6 ft. 3 in. long on upper side.
3 in. thick at the fore end.
2½ in. at the neck.
4¼ in. at the coulter mortice.
3½ in. at the hind tenon.
16½ in. high at fore end from ground
10½ in. high at hind end to under side.
Share, 28 in. long.
Its wing 9 in. long, 10¼ in. wide, 15 in. edge.

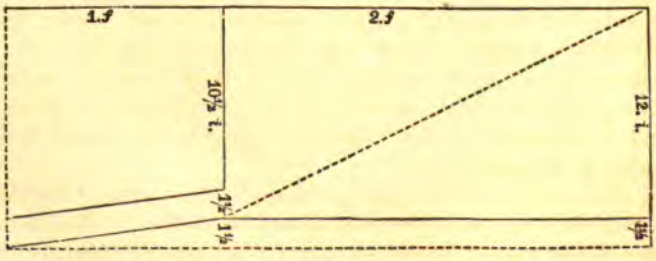
Moulds for Laying off the Back of Mould Board.

HINDER END OF BLOCK.



FORE END.





PRESIDENT JEFFERSON'S PLOW.

BY HENRY S. RANDALL, LL. D.

In the Transactions of the New York State Agricultural Society, 1860, (p. 358,) is given part of a letter addressed by Thomas Jefferson to Sir John Sinclair, March, 1798, describing the mold-board of a plow invented by the writer.

The cut of this mold-board, which accompanies the letter in the Transactions, has suggested to me that I can add somewhat to the information there given by the accompanying drawings, diagrams, etc. These were made in 1796, by Mr. Jefferson's own hand, and the descriptions are in his handwriting. They are from the manuscripts which were entrusted to me by his family while I was writing his biography, and among those I was allowed to retain.

Perhaps some further history of his discovery than has yet been embodied in any of our agricultural publications, is worthy of being placed before the farmers of the land over which this great statesman ruled so wisely; and thus believing, I will throw together such facts as I possess on the subject.

The first mention of any idea on his part of improving the structure of the plow, which I have found among his published or unpublished papers, is contained in his journal of a tour in Germany, made in 1788, when he was American Ambassador in France. He left the Rhine at Strasbourg, and returned to Paris by the way of Nancy, Chalons, etc. The peasantry of Lorraine were engaged in their plowing. To alight, to examine their work, to observe their teams and implements, and to question them about these and their other practical concerns, was strictly characteristic of the philanthropic sympathies and usual habits of Jefferson.

The plows he saw were more remote from the improved forms of the present day, than from those traced in the hieroglyphics of early Egypt. It was the 19th of the bright month of April. As the Ambassador's post-coach rolled along the banks of the Meurthe—up and down the red-soiled hills, dotted with fields of young grain and occasional vineyards—now passing a village of peasants' huts, built of scantling filled in with wicker and mortar, and now a fine old beech forest—now a group of men, women and children at work in the fields, and now a few domestic animals, kept in their fenceless pastures by a herder—he studied the problem of the plow. Stopping at night at Nancy, the capital of the ancient duchy, he made an entry in his journal, from which the following is an extract:

"Oxen plow here with collars and hames. The awkward figure of their mold-board leads one to consider what should be its form. The offices of the mold-board are to receive the sod after the share has cut under it, to raise it gradually, and to reverse it. The fore-end of it, then, should be horizontal, to enter under the sod, and the hind end perpendicular, to throw it over; the intermediate surface changing gradually from the horizontal to the perpendicular. It should be as wide as the furrow, and of a length suited to the

construction of the plow. The following would seem a good method of making it:—Take a block, whose length, breadth and thickness is that of your intended mold-board, suppose 2½ feet long and 8 inches broad and thick; draw the lines *a d* and *c d*, fig. 1, with a saw, the toothed edge of which is straight, enter at *a* and cut on, guiding the hind part of the saw on the line *a b*, and the fore part of the line *a d*, till the saw reaches the points *c* and *d*, then enter it at *c* and cut on, guiding it by the lines *c b* and *c d* till it reaches the points *b* and *d*. The quarter, *a*, *b*, *c*, *d*, will then be completely cut out, and the diagonal from *d* to *b* laid bare. The piece may now be represented as in figure 2. Then saw in transversely at every two inches till the saw reaches the line *c e*, and the diagonal *b d*, and cut out the pieces with an adze. The upper surface will thus be formed. With a gauge, opened to eight inches and guided by the lines *c e*, scribe the upper edge of the board from *d b*, cut that edge perpendicular to the face of the board, and scribe it of the proper thickness. Then form the under side by the upper, by cutting transversely with the saw, and taking out the piece with an adze. As the upper edge of the wing of the share rises a little, the fore end of the board, *b c*, will rise as much from a strict horizontal position, and will throw the hind end, *e d*, exactly as much beyond the perpendicular, so as to promote the reversing of the sod."

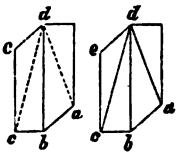


Fig. 1. Fig. 2.

The next glimpse I get of Jefferson's mold-board theory, presents him (then Secretary of State in General Washington's Cabinet,) consulting his friend, the celebrated David Rittenhouse, on that subject. He had now ripened his idea, and the value of his formula, if it should meet his expectations, would be two-fold. First, it would produce the same shape with uniformity—a consideration no longer important in our days of iron plows cast in moulds, but which was immensely so when every separate mold-board used in our country was hewed from a wooden block, without any other guide than the eye. And, second, Jefferson believed that the application of his rule gave that form of the implement which would necessarily, on mathematical principles, secure the desired result with the least resistance from the soil. Rittenhouse believed so too. After examining the subject, he pronounced that fact "demonstrable;"* and the inventor of the "Orrery" was no bad authority.

Jefferson found time amidst his harassing official cares and duties, in the stormy year of 1793, to put his theory to the test of practical experiment. He adapted his mold-board to a plow, or rather a plow to his mold-board, and had a number constructed for his estates in Albemarle and Bedford counties. He soon satisfied himself that they were all he had anticipated of them.

Mr. Strickland, a member of the English Board of Agriculture, being on a visit to Monticello, saw these plows in operation. He was strongly impressed in their favor, and took home drawings of them. These were submitted to his associates in the Board of Agriculture, and that body elected Jefferson an honorary member, and through their President, Sir John Sinclair, (already Jefferson's personal friend and occasional correspondent,) requested him to forward them a model and description of his invention. This occurred in 1798, and the letter already alluded to, printed in the New York Society's Transactions, is a copy of a *portion* of his letter to Sinclair on that occasion. The omitted part is a long and minute description of the new mold-board, with sections, etc., to illustrate its superiority over those in use.

* See Jefferson to Patterson. Congress Ed. of Works, vol. 4, p. 225.

The letter was published entire in the Edinburgh Encyclopedia, and in the transactions and papers of various agricultural and learned societies throughout Europe and the United States. It commanded wide attention, and was everywhere received with profound respect. Honorary memberships, diplomas and medals rained on him from all parts of the civilized world. I have seen a large package of these at Edgehill—the residence of his grandson, Colonel Thomas J. Randolph—inscribed in every language of Europe.

The originality of Mr. Jefferson's discovery has been questioned. William Amos, a writer in "Communications to the Board of Agriculture," England, (vol. 6, published in 1808,) asserts, that as early as the middle of the eighteenth century, the construction of plows "on mathematical principles" was introduced from Holland into Scotland; that the celebrated Rotherham plow was subsequently constructed on the same Dutch model; and that "at length the Americans, having obtained a knowledge of those principles either from Britain or Holland, claimed the priority of the invention, in consequence of which, Mr. Jefferson, President of the United States, presented the principles for the construction of a mold-board, first to the Institute of France and next to the Board of Agriculture in England, as a wonderful discovery in mathematics."

That Mr. Jefferson would claim the discovery of "principles" which he knew were already in use among the plow makers of England, and that he would present them to the Board of Agriculture of that very country as a "wonderful discovery" of his own, is a proposition which involves too much absurdity to merit a grave denial. He believed himself the first discoverer of that particular mathematical formula (or of its application to such an object,) on which his mold-board was constructed. If there is any documentary or other contemporaneous evidence to the contrary, let it be produced. It never has been produced thus far; and I know of no attempt which has been made to produce it, except in such loose and unsupported assertions as those of Mr. Amos. His statements refute themselves. The mold-boards of the Rotherham and Jefferson plows are not of the same form. If, therefore, the Rotherham mold-board was constructed by or on a special or fixed mathematical rule, it must necessarily have been a different rule from Mr. Jefferson's.

There is another competitor for Mr. Jefferson's honors. About the year 1780, a Scotch mechanic, named James Small, invented a plow and mold-board, which gradually superseded the Rotherham plow. Col B. P. Johnson, Corresponding Secretary of the New York State Agricultural Society, who having twice represented our country as an Agricultural Commissioner at the World's Fair in England, has had good opportunities for investigating the subject, writes me that "the mold-board, as invented by Small, is substantially of the same form that has been used in Scotland and England ever since;' that "James Small died in 1793, before Mr. Jefferson's mold-board was invented [published], and that was the reason why the medal was not awarded him in England, as it had been in France," etc. This is proceeding on the assumption that Jefferson's and Small's mold-boards are of the same or essentially the same form, and Colonel Johnson assures me that such is the fact.

If the two mold-boards possess this singular resemblance to each other, to two men separated by an ocean belongs the honor of the same discovery,

practically speaking, though they reached it by very different roads. Mr. Jefferson, however, still retains intact the sole credit of the "discovery in mathematics," for we learn, on the authority of Sir John Sinclair, in his account of James Small (see Appendix to Report on Agriculture of Scotland, vol. 1, p. 353), that the latter perfected his plow gradually and experimentally, and consequently without the knowledge or aid of any such discovery.*

And it distinctly appears, on the same authority, that the Rotherham plow was not the "foundation on which he (Small) proceeded." If there was any particular and really valuable mathematical rule on which the Rotherham mold-board was constructed, James Small ought to have known and not neglected it; and surely Sir John Sinclair ought to have made some allusion to it in describing an alleged improvement on the Rotherham model. Ultimately Mr. Amos admits that the "principles" borrowed by the Americans were not very valuable! He says, "an accidental circumstance made me (William Amos) acquainted with the principles for constructing the mold-board, on considering which *I found them very defective.* Those defects *I have supplied* in the construction of the mold-board."

Mr. Amos leaps with one bound from the Rotherham plow to himself! He nowhere alludes to James Small, though his communication to the Board of

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* In his account of this very interesting man Sir John Sinclair says:

"Young Small was first bound as an apprentice to a country carpenter and plowmaker at Hutton, in Berwickshire. He remained in Scotland for some time after his apprenticeship was over; but about the year 1758 he went to England, where he worked with a Mr. Robertson at Doncaster, in the making of wagons and other wheeled carriages. It was in the year 1763 that he settled at Blackadder Mount, in Berwickshire, under the patronage of John Renton, Esq., of Blackadder. He there set up a manufactory of plows and other agricultural implements; and as he at the same time occupied a farm of considerable extent, he had an opportunity of trying many experiments, which he might not otherwise have been enabled to attempt. He there contrived a device for ascertaining the best shape of the mold-board, by making it of soft wood; by means of which it soon appeared where the pressure was the most severe, and where there was the greatest friction. * * * * * He began with trying experiments on his own farm, with plows of smaller sizes and of different forms, proving by a steel-yard, with a stronger spring than usual, which of them performed the best work with the least force of draught. Some persons are impressed with the idea that he had no other merit but that of introducing into Scotland the Rotherham plow, or reviving a plow that had been made by an itinerant plowmaker, called Lomas or Lummas, many years before, but which had fallen into disuse, neither of which, however, is the fact. That he was well acquainted with the Rotherham plow appears from his own treatise on plows and wheel carriages (p. 172); and he probably would adopt any particulars in the construction of that plow which might appear advantageous; but it is well known that he improved his own plow gradually and by means of repeated experiments; and there is positive evidence that instead of the Rotherham, the old Scotch plow was the foundation on which he proceeded. Besides the testimony of Lord Kames, to be afterwards quoted, his book-keeper, Hector Heatlie, in a letter to one of the late James Small's sons, states 'that when his father began business at Blackadder Mount, in 1763, there was nothing used in Berwickshire but the old Scotch plow, a comparatively very awkward instrument, which went with two oxen and two horses, and indeed often with four oxen and two horses. Your father, observing the faults about her, made and introduced a plow with the broad sock; she was a short little plow, with a wood mold-board, and round in the breast. You know what I mean. The mold-board was round on the top, and not straight, which consequently made her worse to draw. This plow was much esteemed, and she was far easier drawn, and made tolerable neat work, especially on ley ground; but your father did not stop there, but continued to make some additional improvements on her.' * * * * It was about the end of the year 1779, or the beginning of the year 1780, that James Small made a pattern in wood for the mold-board and also for the land-side plates of his plow, and he took them with him to Carron, *where he got them cast.* * * * * Some years afterwards he made another important improvement, that of getting the sheath and head, which were formerly of wood, *made of cast iron.*"

Agriculture was published twenty-eight years after Small's invention and fifteen years after his death. Was Mr. Amos so ignorant as this of the history of the subject he was treating of, or did he intentionally suppress the facts?* Either hypothesis shows how unfitted he was for the task he attempted.

The author of the Declaration of American Independence will probably appear to some in a new and pleasing light, as a close observer, and even inventor, among the common implements of rural and every day life. His tastes, in truth, ran as strongly in these channels as Franklin's; and I have sometimes thought, that had he found as much leisure for the investigation, he would have manifested almost as much inventive genius. Jefferson was but a young man, with his professional education barely completed, when the great drama of the Revolution began to open, and from that period to the sere autumn of life—when the projecting and inventing activity of the brain and hand become torpid—he was an engrossed and central actor in mighty events. But the utilitarian taste—the propensity to *improve* everything which tends to lighten the labors and sweeten the bread of humanity—constantly gleam out. They appear on every page of his earlier unpublished memoranda—which have often been examined by me. They extend from objects of important concern to those which we should scarcely expect such a man to notice.

Jefferson went abroad soon after the Revolution. His official duties, in that trying hour of the Republic's history, were incessant; but public business carried him from the seat of his embassy (Paris) to England and Holland, and a broken wrist led him to try certain medical waters in the south of France. He made this last journey embrace official duties as well as health, and with the same view he made a short trip in northern Italy. His journals of these different excursions—for they can hardly be called tours—at first view strike us with astonishment, not altogether unmingled with disappointment. This splendid classic scholar, this man overflowing with all historic knowledge, this writer of matchless force and beauty in describing natural scenery and objects, will surely say something to be remembered about Stratford-on-Avon, the battle field of Worcester, Westminster Abbey, the

"Chiefless castles, breathing stern farewells,"

on the banks of the "majestic Rhine," the Roman remains at Nismes, the Fountain of Vaucluse, the Alps, and Italy! But had a commissioner, sent out by some society "for the promotion of agricultural and useful arts," traversed the same scenes, his topics would have been the same, and his treatment of them not more dry. We get abundant facts about the condition of the people, the soils, products, culture, domestic arts and topography of different regions—about manufactories, machines, bridges, implements and structures of all sorts, down to Dutch wheel-barrows and vinegar cruets—but if a high

* Again, if the "principles" of the Dutch or Rotherham plows—the only important ones which Mr. Amos recognizes the existence of before *his* day—had been well known in Holland and Great Britain for half a century; if Mr. Jefferson had claimed and *published* them as his own ten years before Mr. Amos wrote, how could the latter have been indebted to an "*accidental* circumstance" for a knowledge of them? Perhaps too many pains are bestowed on exposing the misstatements, suppressions and inconsistencies of this singularly bungling yet self-complacent writer; but the compliment is paid entirely to the place where his statements are made and not to the author.

thought flashed through his mind, amidst scenes so consecrated by association, its radiance was not communicated to his pen.

It was not that Jefferson was unmoved by the things which move other highly cultured men, but in his mind the practical—the facts which pertain to the interests and happiness of men, and especially of the weak, and weary, and wayfaring, and toiling, and suffering class of men—always took precedence over effusions of sentiment or the indulgence of elegant tastes. The whole philosophy of the man is summed up in the following extracts from a letter, which he addressed to Lafayette from the south of France in 1787:

"In the great cities I go to see what travelers think alone worthy of being seen; but I make a job of it, and generally gulp it all down in a day. On the other hand, I am never satisfied with rambling through the fields and farms, examining the culture and the cultivators with a degree of curiosity which makes some take me to be a fool, and others to be much wiser than I am. * * * * From the first olive fields of Pierrelatte, to the orangeries of Hieres, has been continued rapture to me. I have often wished for you; I think you have not made this journey. It is a pleasure you have to come, and an improvement to be added to the many you have already made. It will be a great comfort to you to know, from your own inspection, the condition of all the provinces of your own country, and it will be interesting to them at some future day to be known to you. This is, perhaps, the only moment of your life in which you can acquire that knowledge. And to do it most effectually you must be absolutely incognito; you must ferret the people out of their hovels, as I have done, look into their kettles, eat their bread, loll on their beds, under pretence of resting yourself, but in fact to find if they are soft. You will feel a sublime pleasure in the course of this investigation, and a sublimer one hereafter, when you shall be able to apply your knowledge to the softening of their beds, or the throwing a morsel of meat into their kettles of vegetables."

Monticello in its palmy days—alas! how bare and desolate now—was a nagazine of *utilities*—of labor-saving contrivances—of mechanical arrangements—of minor inventions of every sort and description—evidencing the tastes and inventive habits of its owner. It was a self-sustaining little *imperium* in the not self-sustaining *imperio* of the Old Dominion. The wool was grown, carded, spun, woven, dyed, and made into garments on the farm. The mill ground grain, the nail factory made nails, the coopering establishment, smithery, brick yard, etc., supplied their products not only for the estate but for the neighborhood; and all of them turned out the best work known in the circuit of miles. All of them had various handy contrivances devised by their owner, which saved toil and promoted system. His flax was dressed in a machine invented by him, and copied by all his neighbors. An embryo extension-top carriage, contrived by himself, let in the sun and shut out the storm at his will. The deep well had a fixture to render the elevation of water easier. The gates had better hinges and latches than other people's. The house, the offices, the servants' houses and the stables abounded with conveniences nobody else had thought of.

Jefferson lovingly supervised all the clattering industry of this farm metropolis. He *wrought* at several of its trades. He could handle an adze, or hammer out and finish up a nail, with the best of them. He soared even to the mystery of turnining a horse shoe, and could have nailed it on in case of need. He had a particular shop of his own filled with choice and multifari-

ous tools, and here he made and repaired the wooden portions of his philosophical, engineering, and other scientific instruments—made models in architecture (of which he was excessively fond), and hewed out "mold-boards of least resistance." And a powerful, brawny worker was he. Standing stark six feet two and a half inches in his stocking feet—with strength fully equal to that of two ordinary men—with tendons strung by constant and protracted exercise in all weathers—the saw buzzed and the hammer clanged merrily in his great strong hands.

His inventive faculties acted with the rapidity of intuitions. He who from his early boyhood read off difficult mathematical problems "with the facility of common discourse," would be expected to judge well and quickly of the application of mathematical principles to their appropriate concerns. Accordingly the defect and the remedy in the construction of such objects occurred to him at the first glance. Thus it was with the plow.

Notwithstanding all the preceding facts, Jefferson had an æsthetic side to his mind, of which we see little in Franklin. His house was one of the finest specimens of architecture of its day. It was filled with statuary, painting, and other articles of vertu. Beautiful gardens, filled with the rarest flowers, extensive pleasure grounds adorned with the finest native and exotic trees and traversed with walks and drives which commanded the noblest scenery, graperies, orchards for figs, for peaches, for pears and for apples, a deer park fencing in one of the wildest gorges of the mountain, and various other things in keeping with these, show that he did not strictly confine himself to the *utile*.

But I have got out of my *furrow*, and diverged from Jefferson's plow to Jefferson. The topic is as seductive to me as was the "dejuner of his most sacred Majesty" to Lady Margaret Bellenden!

CORTLAND VILLAGE, N. Y., *February*, 1863.

RABIES IN A FLOCK OF SHEEP.

BY HENRY S. RANDALL, LL. D.

On Christmas eve, 1862, some sheep belonging to my son, Henry P. Randall, were bitten by a dog. I saw them next morning. The flock consisted of about one hundred ewes, three years old last spring, and in lamb. I thought a dozen or more were wounded; but as their hurts did not appear dangerous, I did not go to the trouble of ascertaining the precise number. All were bitten, so far as I could discover, only about the head, and principally about the nose and ears. The ears of some of them were torn into shreds, and their noses and lips covered with tooth marks, showing that the attack on them had been long persisted in. This was evidently the work of an animal which was unable to kill the sheep outright.

On Christmas morning, a small dog, belonging to a neighbor, was found attacking some sheep owned by the Messrs. Freer, kept about three-quarters of a mile from the preceding. He had wounded two of them in the same way, but more severely, when he was discovered and driven away. He returned to the attack not long afterwards, was again detected, followed home, and killed the same day. The idea of his being rabid did not then occur to any one, though the facts I have since learned lead to the impression that his disease would have been apparent to a person familiar with its symptoms.

The wounds on H. P. Randall's sheep were found to heal rapidly, and nothing was done for them. On the 12th of January, 1863, he informed me that he had found one of the bitten sheep on the ground unable to rise; that, on his helping it up, it moved about with difficulty. It had frothy saliva about its mouth. The next day it died. He had observed some ewes riding each other about prior to the 12th, but did not know whether the dead one was one of these.

On the 14th of January, he informed me that two or three of the wounded sheep were riding and fighting each other; that one of them had suddenly butted him from behind; that on his turning and offering to kick it, it would not retreat. He confined it in the barn.

I saw the flock in the afternoon. It was in fine condition. The wounds of the bitten sheep were mostly healed; and, with two exceptions presently to be noticed, they looked as healthy and full as any in the flock.

After examining the diseased sheep, I immediately returned to my house and made the record, under that date, which follows. All the subsequent records were made, in like manner, immediately after the examinations. I recorded every appearance which struck me as unusual in healthy sheep.

JANUARY, 14, 1863,
Four o'clock, P. M.

Weather warm and rainy.

No. 1. The ewe which attacked H. P. R., and which he confined this morn-

ing, is a bony, strong animal, fleshy, but hollow as if from want of feed; shows scars of dog's teeth about nose, and a wound on lower lid of right eye, yet covered by a scab; corner of right eye opaque and light colored. Sight of it apparently gone. When I reached her place of confinement, she bounded forward (striking fore feet on floor together), and butted violently against the partition which separated her from me. She repeated this whenever I made any motion towards her, and sometimes rapidly struck the partition two or three times in a manner betraying excessive fury. Every time she thus advanced, she emitted that loud snuffing sound (caused by a violent expulsion of air through the nostrils), which is often heard from sheep, and especially from rams (and also from cattle), when approached by a strange dog or other object which excites rage and alarm. These assaults were repeated fifteen or twenty times, and as often as I provoked them, with undiminished fury. In the intervals she stood with ears advanced, and gazed at me steadily. H. P. R. says she has always been one of the wildest and shyest sheep in the flock. No froth or saliva about lips; could detect no other unusual appearances.

No. 2. A smaller and weaker ewe than preceding; in good condition, but hollow. One of her ears was torn into several strips by dog—not yet healed; edges of the wounds raw and bloody (the only case of the kind in flock.) Night approaching, put her in pen in barn at once without stopping to observe her actions in flock. Less fierce, and much less active than No. 1; but butted a stick pushed against her, and also once or twice the partition on the other side of which I stood; would not retreat a step, though I whipped her smartly on head and ears; could have retreated fifteen feet. She uttered no snuffing sound like No. 1; no froth or saliva about mouth; discovered nothing unusual about eyes.

No. 3. A strong, healthy looking ewe, with scars of dog's bite on nose; when first seen was running out of barn with head down and extended horizontally like a ram's when he is, in shepherd's phrase, "teasing" (seeking to cover) a ewe. She dashed at the only ram in the flock,* and bit several mouthsful of wool from his side, which, after being chewed an instant, were swallowed. She then commenced "teasing him" by holding her head as before stated, darting it towards his flank, standing with her shoulder at his breech, striking with the fore foot nearest him, and at short intervals attempting to ride him. All these are precisely the movements of the male animal under such circumstances; and she constantly uttered the same sound the ram does in "teasing"—one familiar to all observers of sheep, but to which I am unable to give any appropriate name. These movements are wholly unlike those of the ewe in heat, and she utters no such note. The ram turned and fought away No. 3. She then made the same demonstrations towards ewes, passing from one to another, and moving constantly and restlessly about the flock. This continued until we drove flock into the barn to catch her. It was twilight, and in the darkness of the barn we mistook the figures marked on rump and caught the wrong one. On putting it in pen with No. 1, the latter immediately attempted to ride it, and went through all the ram-like demonstrations previously witnessed in No. 3, and with still more violent indications of salacity (lust.) She pursued it with fierce eagerness until we left.

* He was removed the next day.

JANUARY 15*th*, 10 *o'clock*, *A. M.*

Weather mild and pleasant.

No. 1. Appeared and acted as yesterday, except that she was hollower and greatly weaker. Fell twice in attempting to dash against partition, and seemed unable to rise; but, on being stirred with a stick, got up and renewed the attack; failed in no case to charge when a hat, handkerchief, or the like was shaken at her; charged furiously at some straws which hung down overhead from hay-mow, and which probably hit her face. In the intervals frequently renewed the ram-like movements towards the sheep put in pen last night.

No. 2. Weaker and thinner; stood close to front partition, refusing to retreat, and fighting a stick as before; exhibited less force, however; fell several times; paid no attention to snow poured on and before her; some froth visible about lips; could observe the beating of carotid artery at base of neck by motion of the wool where it was thrown open and detached into separate locks by position of shoulder; pulsations counted by a watch, and thought to be about one hundred and forty a minute. The respiration was rather labored.

No. 3. Had been caught earlier in morning, and put in pen with No. 2, but had jumped out. Therefore observed her again in flock; exhibited the same restless and tireless salacity as on day before, and with precisely the same manifestations. During the hour of my stay, she did not cease for a moment to pass through the flock "teasing" different sheep in succession, like a ram in search of a ewe in heat. When approached by a man, exhibited the natural degree of timidity.

JANUARY 15*th*, 4 *o'clock*, *P. M.*

Weather colder.

No. 1 and No. 2 have been removed and put together in a small out-door pen, sheltered on the north by a straw stack. No. 3 has been put alone in a pen with an area of about twenty by forty feet, partly sheltered on north and west by a barn and overhanging straw stack. This is intended as the common receptacle for future patients, should there be any.

No. 1. Exhibited no change since morning.

No. 2. Still weaker; groaned plaintively when butted by No. 1. When the latter was irritated with a stick she dashed at side of pen, and then frequently turned and attacked No. 2. They fought each other with fury. No. 2 fell repeatedly, and No. 1 occasionally, from weakness. As soon as they could get up the combat was renewed. Both occasionally manifested the usual salacity.

No. 3. Was most of the time gnawing the rails of pen; nothing else unusual observed.

I have not thus far seen either of them eat a morsel of natural food, ruminate, dung, or urinate, nor have I heard them bleat.

JANUARY 16, 10 *o'clock*, *A. M.*

Weather cold.

No. 1. Exhibited same general conduct and appearance. There was a slight purulent discharge from eye, the lid of which had been bitten. I

thought that the wound on the lid looked more congested. She refused to touch choice hay, though she had been purposely deprived of it for nearly twenty-four hours.

No. 2. Dead, and stretched out on side.

No. 3. Gnawing rails, as yesterday; often rubbed the top of her head against rails. Now, for the first time, though she had been daily tried, turned and butted a stick pushed against her. She also repeatedly dashed at me on other side of fence. When she attacked a stick, or the like, she opened her mouth as if to bite it. The large and icy end of a rail being brought close to her head, she did not bite but butted it. She did, however, seize the iron tines of a fork with her teeth. Gave her fresh hay, after she had undergone same fast with No. 1. She snatched off a clover head or two, and swallowed it without regular mastication—as she had swallowed wool before being put alone—but ate no more.

JANUARY 16, 2 *o'clock, P. M.*

Weather somewhat moderated.

No. 1. Nothing new was observed.

No. 3. Bit eagerly at a small pine pole; as often as it was placed within her reach she seized it with her teeth, and held on for a second or two. This did not appear to me to proceed from any propensity to eat the wood, as I have so often seen her doing, or to "nibble" it merely, as mentioned by Mr. Youatt, but from a desire to inflict injury by biting. She opened her mouth menacingly when the pole was flourished within a yard of her. When provoked to advance on a man, she did so with open mouth, or gnashing, as if from rage. Her whole appearance and actions betokened ungovernable fury.

No. 4. On this visit to the sheep I was accompanied by several gentlemen. When we passed through the main flock, merely on the other side of a barn from the diseased ones, all the former were eating, ruminating, or acting in the usual manner of perfectly healthy sheep. On our coming in sight of them again, half an hour afterwards, a ewe was passing about the flock, exhibiting all the ram-like movements described in the case of No. 3. She was of medium size, fleshy and strong. There were wounds of dog's teeth, not entirely healed, on one side of face, and some faintly perceptible scratches about eyes. Put her in pen with No. 3. The latter sprung at her first, biting out several mouthfuls of wool, and then eagerly attempting to ride her, and butting her furiously when she resisted. No. 4. fled wildly about the yard, making repeated attempts to scale the fence. Occasionally she turned and fought for a moment and then renewed her flight.*

JANUARY 17, 4 *o'clock, P. M.*

Weather cold.

No. 3. More restless, when undisturbed by bystanders, than before; bit a dozen mouthsful of wool from No. 4 within five minutes; no other change observed.

* The Messrs. Freer, whose sheep were bitten the morning after H. P. Randall's, were present at this visit to the sheep. They stated that one of theirs died on the 11th, and the other on the 13th inst. Having no suspicion of the nature of the disease, they had not watched its progressive symptoms with any of the care that I am doing; but they at once recognized this as the same malady. They had noticed in their sheep the same propensity to ride, the same fearlessness, the same rubbing of the head, and, as they remarked, "the same appearance generally."

No. 4. Bore several pretty severe raps with a pole before she would retreat; but did not yet fight pole or man. Both sheep rode, fought, and ate wool as previously. All do the last alike. It is snatched out, bitten two or three times, probably merely to facilitate swallowing, and then suddenly swallowed.

I have been trying from the outset to satisfy myself whether there is any change in the appearance of the eyes. There is certainly no marked change; but I begin to feel pretty confident that I detect a slight glistening which is not natural; and sometimes, as one of these sheep has stood watching me, I have fancied its eyes wore an expression of wildness and anxiety.

JANUARY 17, 10 *o'clock, A. M.*

Weather bright and cold.

No. 3. Less action and irritable than yesterday. Did not bite a stick; was quite weak; fell two or three times when fighting; eyelids drooping; wool on top of head much rubbed; rubbed head often with hind foot.

No. 4. Looked hollower; was more uneasy and quarrelsome; advanced on me once or twice when provoked with a stick, but retreated when struck; was very furious towards No. 3, and the new patient next to be mentioned; darted at them two or three times from a distance, when all were standing quiet; eyelids swollen; eyes half closed; a watery discharge from them, which had wet the hair on cheeks nearly to the nose; scars on face had become red; wool on head rubbed and torn; rubbed it very frequently with hind foot.

No. 5. H. P. R. observed her riding and fighting at the morning foddering. A low, round, fleshy, strong ewe, evidently quite forward with lamb. Had scars and a stain of blood on left side of nose; exhibited the characteristic salacity. When put in the pen with No. 3 and No. 4, and attacked by them, she fought desperately. I saw her twice go to the breech of one of the others, bite off a dung-ball and swallow it. Retreated when threatened by a stick. Ate a morsel of turnip, when some fresh sliced ones were put in yard.

The other two took no notice of turnips or fresh hay offered to them. I watched the three a considerable time, doing nothing to disturb them. They fought less when undisturbed. They moved about restlessly, sometimes biting wool, sometimes rubbing their heads, &c., &c. Occasionally they attempted to ride each other, and this led to fights.

I have not from the first seen one of them drop dung. There is much less dung observable on the smooth, snowy bottom of the pen than I should expect from healthy sheep; but its appearance, so far as I can judge, is natural. It is in the usual dark, rounded pellets. I have seen one urinate slightly once; I have observed no marks of it on snow.

JANUARY 18, 4 *o'clock, P. M.*

Weather milder, but cold.

No. 3. Weaker; rubbed her head incessantly. When standing still, suddenly fell, with a spasmodic movement of limbs, and lay stretched out on side. On hitting her with some small bits of ice, she rose, and advanced on me with her mouth open; also again bit at a stick; uttered a short bleating sound, and at other times groaned, when butted by other sheep. Perhaps the voice was shriller and more plaintive than usual, but don't think I should have noticed it had I not been looking out for such a change.

No. 4. Scars had a more inflamed appearance; eyelids more swollen; lips considerably swollen; excessively restless.

No. 5. Also very restless; no new appearances; all the diseased sheep riding, fighting, eating wool, etc., by turns as previously, but No. 3 is considerably less active than the others.

JANUARY 19*th*, 10 *o'clock*, *A. M.*

Weather bright and cold.

No. 3. Exhibited some mucous discharge from nostrils. On holding out a stick to her, she did not appear to me to bite it, as previously, to inflict injury or manifest rage, but to "nibble" it. Every part of pen shows marks of sheep's teeth; all frequently gnaw wood. No. 3 several times uttered a very short, shrill bleat or cry when fighting.

No. 4. As I approached pen, saw her snatch and hastily swallow a mouthful of straw from stack; was bolder in attacking a man; rushed at me twice, with the characteristic bound and snuffing sound, on my entering pen to make a closer examination. Her eyes were nearly closed. On getting near, I observed that the discharge from them was somewhat purulent, and that the lower and outer margin of each cornea had become semi-opaque and light colored. The scars on her face were inflamed. The slight wounds on the eyelids were now visible, and, to some extent, reopened. She nibbled or gnawed a stick when held out to her, and rubbed her head often. The part uniformly rubbed by all of them is that over the parietal bones.

No. 5. No observable change in appearance. All rode, fought, etc., as usual. I again carefully examined bottom of yard, still covered with snow, and found little dung and no marks of urine.

JANUARY 19*th*, 4 *o'clock*, *P. M.*

Weather milder.

No. 3. No material change. Ate a little ice; ate snow on which a ewe just placed in the pen had urinated; trembled all over when standing quiet.

No. 4. Inflammation about scars apparently subsiding; cornea of both eyes more opaque; appeared to be nearly blind; considerably emaciated.

No. 5. More excitable; eyes glistened; ate wool very frequently.

No. 6. A thick, heavy, beautiful ewe in high condition, and a picture of healthy vigor, was found riding the ewes, etc., in the flock like the three preceding patients. Numerous scars of dog's bite on right side of face healed over; upper part of face and eyes not visible on account of wool. When put in pen with preceding, they, for a moment, acted like rams preparing for battle, then dashed at her with fury, and pursued her at full run. Even No. 3 roused herself from her torpor sufficiently to join in the chase. The usual riding, fighting, etc., succeeded.

JANUARY 20*th*, 10 *o'clock*, *A. M.*

Weather cloudy and moderate.

No. 3. Weaker and more quiet; gnawing wood, however, as usual; uttered short, plaintive bleats when butted by the others.

No. 4. Thinner and weaker; obviously blind; stood still when not disturbed.

No. 5. Was rather quiet. No other change observed.

No. 6. Was more bold and quarrelsome than on preceding night; wool on head showed much butting and rubbing.

No. 7. Another ewe attacked by disease; medium in size, and in excellent condition; bitten under lower jaw, and on right ear; scab remains on latter. I saw her offer to ride another ewe yesterday afternoon, but she almost immediately ceased, and resumed eating. As she remained quiet, and I had no assistance, I left her in flock over night. This morning she was riding, etc., in the usual manner. This is the only case where I have observed any lull after first attack. Her eyes are either naturally different from others, or they are more changed than usual in expression. I think the latter. They appeared glassy and staring. She was exceedingly bold and quarrelsome when put in pen with the other rabid ewes. She did not await attack, but at once knocked down No. 3 and No. 4, and fiercely butted the head of No. 3 when lying on the ground, then stopped and appeared to smell about her head. When No. 4 fell so that her head went out of sight under barn, No. 7 kneeled down on her knees and thrust her head under barn alongside. Her salacity was furious. She uttered the teasing note of the ram loudly, if not shrilly. She ran out her tongue with a lapping motion when she approached the others.* I could beat her away with difficulty from No. 3 and No. 4, which huddled into a corner near me, and which she continued to knock down. When driven away, she immediately returned to fight, or attempt to ride them.

Under this strong excitement of the sexual organs, I have observed, uniformly, that not a single patient has, for an instant, acted like a ewe in natural heat by standing to be ridden, or in any other way; and in every case turns upon and fights the one attempting to ride her.

JANUARY 20*th*, 4 *o'clock*, *P. M.*

Weather warmish and pleasant.

No particular change observable, except that No. 7 was more quiet.

JANUARY 21*st*, 10 *o'clock*, *A. M.*

Weather warm.

No. 3 and No. 4. Becoming more weak and torpid.

No. 5, No. 6, and No. 7. Exhibited the usual symptoms when roused, but the two last were less active and quarrelsome than yesterday.

JANUARY 22, 2 *o'clock*, *P. M.*

Weather warm and thawing; a little snow falling.

No. 3. Crouched down in a corner unable to rise; respiration labored; moaned piteously at almost every breath.

No. 4. Stretched out on side unable to rise; respiration faint and irregular. I entered the pen and examined her closely. Eyes closed; opened them, and found both corneas opaque; evidently wholly blind. The slight wounds or scratches on the eyelids very visible. Both lids of one eye and the lower one of the other exhibited wounds. Body denuded of wool in several places.

Nos. 5, 6 and 7. No observable change. When in pen, I irritated them, by pushing them, &c., with a stick. No. 5 rushed at me three times fiercely.†

* I have often seen a ram do this.

† I parried her blows with a little stick, without using any violence. Edwin Hammond, Esq., of Middlebury, Vermont, one of the most experienced and observing sheep breeders in the United

Could not provoke No. 6 or No. 7 to attack me, though they evinced very little fear.

JANUARY 23, 10 *o'clock*, *A. M.*

Weather mild and pleasant.

No. 3. Dead, where I last saw her crouched down, with legs under her.

No. 4. Dead, in same place and posture as last seen; no marks of struggling on snow.

No. 5. Stood quiet and gazed at us, when not attacked by the others. Had grown thinner; saw no other change.

No. 6. Considerably thinner; wool on head torn; had evidently fought and dashed about much since preceding visit. Would now attack a man if provoked; bounded forward, uttering the snuffing sound repeatedly mentioned. The scars on her nose had become so red as to be visible across the pen. Exceedingly quarrelsome towards the other sheep; darted at them suddenly from a distance, when all were momentarily quiet; almost uniformly sprung at No. 7, when No. 7 sprung at bystanders; gnawed rails and sticks; nibbled the short hair and the skin under fore leg on dead body of No. 4; (the leg had been extended forward at death so as to uncover this part) persisted in doing this a long time, though twice driven away; trembled slightly when at rest.

No. 7. Had also reached the point of attacking a man; rushed at us several times when small things were tossed at her; snuffing, etc.; respiration rapid and irregular; trembled slightly when at rest; licked and nibbled about the nose of dead No. 4, apparently to obtain the mucus and saliva there collected; showed even more pertinacity in this than No. 6 did in nibbling at the other parts of carcass; both were excessively irritable, and they had frequent battles.*

JANUARY 23, 4 *o'clock*, *P. M.*

Weather still warm.

No. 5. No change observed.

No. 6. More furious; no other change observed.

No. 7. Still licked and nibbled at nostrils of dead No. 4. A change of weather being apprehended, I entered pen to cover dead bodies to prevent their freezing, as I expected a post-mortem examination soon to take place. Moved so quietly that No. 6 and No. 7 did not attack me. Covered carcass of No. 4 pretty deeply with straw. The head was not covered so deeply as I supposed, and as soon as I left the pen, No. 7 went immediately to the spot, thrust her nose four or five inches down through the straw directly to the

States, and two other intelligent breeders, accompanied me on this visit. Other experienced breeders and sheep owners, to the number of more than fifty, have previously examined them. No one had seen a case of rabies before, and no one recollected ever to have seen a ewe, either sick or well, simulate the actions of a ram, or exhibit ferocity towards a man, as these do, or exhibit many of their other symptoms.

* Dr. Frederick Hyde, Professor of the Principles and Practice of Surgery in Geneva Medical College, was with me on this visit to the sheep. He thought all of them, and particularly No. 7, had an unnatural expression about the eye—that look which I have termed glistening. Dr. Jewett of this place has visited the sheep nearly every day since the first attack of the disease, and he is of the same opinion.

nose of the dead sheep, and resumed her occupation of licking it, &c. Probably there was a continued discharge from nose. No. 6 was now disposed to share in the filthy repast, and they two or three times butted each other away from it.

JANUARY 24, 10 *o'clock, A. M.*

Weather moderate.

No. 5. Quieter than the others.

No. 6. Excessively furious. The scars on side of face raw and bloody; face swollen. When irritated, sucked in the corners of her mouth, protruded and elevated her upper lip, and occasionally, as she bounded towards bystanders, emitted a sound evidently not produced solely by the expulsion of air through nostrils; the vocal organs had something to do with it. It sounded not unlike the growl, or, perhaps, rather the half uttered bark of a dog—a coincidence it is presumed purely accidental. She indicated a propensity to bite, as No. 3 had earlier done. Opened her mouth and gnashed as she attacked a man or stick; but did not see her bite other sheep.

JANUARY 24, 1 *o'clock, P. M.*

Weather warm.

No new appearances, except that No. 6 and No. 7 were less excited than in the morning, and rubbed their heads much with their feet, against fence, &c. I entered pen and shook umbrella. No. 6 charged me so vigorously that I had difficulty in keeping her off.

JANUARY 25, 10 *o'clock, A. M.*

Weather spring-like; sun shone brightly.

No. 5. Stood with head drooping, and slightly trembling; occasional jerking of head or other part, as if asleep; rubbed her head occasionally. I entered pen with pail of water.* She looked at it, but did not drink. I stepped up and pushed her with a short stick. She attacked me, but on receiving a sharp rap on nose retreated.

No. 6. More quiet when undisturbed, but when irritated by a stick, violently attacked it or the other sheep. Wounds on face scabbing over again. Rubbed her head occasionally; rubbed her breech frequently and hard against rails of pen. When entirely at rest her head drooped down, and she trembled. Was obviously weaker; fell once in charging No. 7. Stepped up to pail of water, and played her nose about in it a few moments, as a horse often does. I thought she drank a little. After leaving pail, returned in ten minutes and repeated same motions.

No. 7. Much weaker; rose with difficulty, and soon fell; did not approach the water. I thought her belly appeared more distended. Respiration labored and stertorous; it could be heard a number of rods from the pen. Held up and twisted round her head as if in extreme pain.

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* Though expecting no peculiar dread of water, or the contrary, in these sheep, I intended to place it before them several days earlier, but it was incidentally omitted. Up to the 25th there had been abundance of snow in the pen.

JANUARY 25, 4 *o'clock, P. M.*

Weather continues the same.

No. 5. Had grown weak very rapidly since morning; could not get up.

No. 6. More emaciated; less quarrelsome. I entered the pen and approached her closely without her attacking me; but she advanced on me when I pushed her with a stick. Rubbed her breech violently and almost incessantly against fence. Brought round her head twice to her breech, as if to bite it. The flock of undiseased sheep coming near the pen and bleating for food, No. 6 several times bleated in reply. I thought the sound entirely natural.

No. 7. Still weaker; laid stretched on side; made painful but ineffectual attempts to rise; respiration labored and irregular, but no longer stertorous.

JANUARY 26, 4 *o'clock, P. M.*

No. 5 and No. 7 dead; no appearance of struggles.

No. 6. Again violently excited; bounded forward at me several times, with open mouth, and snuffing loudly on my merely making a noise. The wool being now partly rubbed off her face, her eyes were occasionally visible. I thought the inner margin of cornea of right eye partly opaque. When undisturbed, she rubbed her breech almost incessantly. Had torn considerable wool from it, so that mouth of vagina became temporarily visible; it was considerably swollen and inflamed. It appeared to be the part she sought to rub.

JANUARY 27, 10 *o'clock, A. M.*

It rained heavily yesterday afternoon; the weather now mild, and a little snow falling.

No. 6. More active and furious than I have ever before seen her; bounded round pen incessantly, snuffing, etc. Repeatedly dashed up to the fence where I was standing to attack me, though I made no sound or movement. Paused two or three times within a yard of me, and gazed up over a close board fence at me. This gave me an opportunity to examine her eyes. The inner portion of cornea of right eye was semi-opaque, and the eye bloodshot at its inner angle. Its vision, however, was not seriously impaired, for on moving my hand towards her, out of sight of left eye, she exhibited the most violent rage. I also could now plainly see a wound immediately under right eye, with a fresh scab over it like those on nose.

JANUARY 28, 10 *o'clock, A. M.*

Weather moderate.

No. 6. More emaciated and a good deal weaker. Scabs on face looked drier, as if rapidly healing; froth constantly exuding from front part of mouth, and ropy saliva dropping to the ground. When not moving about, her head sunk down low, and she trembled. She laid down and her head sunk to the ground, as if from complete exhaustion. There was a spasmodic motion of the flanks at every fifth or sixth inspiration. This motion was occasionally repeated three or four times with great rapidity. The corners of the mouth were singularly drawn in; yet, with all this debility, she retained her quarrelsomeness and fury. On being stirred with a stick, or something thrown at her, she rushed at us, and again scoured about the pen, stumbling over the

carcasses of her dead companions and over the water pail. She rose with some difficulty; but as soon as on her feet again, in all cases, renewed the attack.

The pen exhibited the same lack of dung and urine as heretofore. The water pail was tipped over, but while water stood in it I could not discover that it was diminished by drinking.

JANUARY 29, 10 *o'clock, A. M.*

Weather cold, and a foot or more of snow has fallen.

No. 6. Dead, and stretched out on her side.

SUMMARY.

The cases above described present variations in the minor developments of rabies, owing perhaps to individual peculiarities of the different animals; but, as a whole, there has been a remarkable indentity in the general symptoms.

Assuming that the rabid sheep, which I have designated as No. 3, was seen by me on the first day of the attack of the disease—a fact of which I entertain no doubt after comparing the subsequent symptoms with those of the later ones—and estimating the two first numbered cases to have had the average duration of the other five,* the period of "incubation" in the whole seven (that is, the period between the sheep's being bitten and the appearance of rabies,) ranged from fifteen to twenty-six days, and averaged about twenty-one days.

The first observed symptom, in every case which was seen at or near its commencement, was the same, viz., ungovernable apparent salacity, manifested not according to the sex of the patients—all of which were ewes, and supposed to be in lamb—but in the manner in which the ram exhibits sexual heat. This resemblance extended to the minutest particulars in movements, postures, and in that characteristic note with which the male animal expresses desire as he approaches and importunes the female. In no instance did the rabid ewe show any of the usual indications of rutting. She incessantly attempted to ride her companions, but uniformly manifested rage and turned and fought the one attempting to ride her. This propensity remained active until the sheep became too weak to exercise it, and never entirely ceased.

In all the cases, rumination was totally suspended from the first visible attack of the disease until death; and throughout the same period, all the patients, with perhaps one exception,† were not seen to consume an ounce of natural food, though the choicest was repeatedly offered to them—in some instances, where they had been purposely deprived of it for twenty-four hours. They, however, manifested a depraved appetite. All of them frequently ate wool from each other, and gnawed the rails of their pen. One was seen to eat dung balls from the breech of another—another snow which had just been saturated with sheep's urine—and two eagerly to lick the mucus and saliva

* So little is known of the facts in the first case, which terminated fatally on the 13th of January, that I did not number it, nor have I included it in this summary.

† No. 7 was seen for an instant attempting to ride another sheep the afternoon before the disease, apparently, was fully developed. She resumed eating hay while I stood looking on. I observed her eating for perhaps five minutes. When I next saw her she was rabid.

from the nose and mouth of a dead one, and afterwards the post-mortem discharges from the same parts. They preyed upon every substance within their reach which was unnatural as food, except the flesh of their dead companions. Their eating, as I have termed it, was attended, so far as could be observed, with no regular mastication. When they gnawed the rails of their pen, they held their heads down and extended, so that it could not be seen whether they masticated or not. They did not pause and raise their heads to do so, but continued intently gnawing. The only evidence I had of their swallowing the wood was, that considerable quantities of it were bitten from all parts of the pen and none of it could be found on the snow underneath; and as some of the wood gnawed was of a red and much of it of a dark color, it would have been readily visible there. When they ate wool, dung balls, and the like, they generally snatched them, as if in haste, and in all cases swallowed them after two or three rapid movements of the jaws, which were apparently only made to place the substance in a situation to be forced into the esophagus.

No exhibition of thirst was observed in any case, and, on the other hand, no dread of water, when it was placed in a pail before them. One played in the water with her nose, as a horse is often seen to do, and drank a little without apparent difficulty. One or two were seen to nibble a little ice or snow on two or three occasions.

The evacuation of both dung and urine was very slight. The feces appeared natural in color and consistency.

I came to the conclusion, after considerable hesitation, that the disease, in its earlier stages, and perhaps throughout, was accompanied by a slight unnatural expression of the eyes, which, for the want of a more expressive term, I have called glistening. But I do not think any one could safely undertake to select a rabid sheep from a flock, even if one was known to be there, by this indication alone. Yet obscure as is this symptom, it is the only one which distinguishes the rabid sheep, in appearance, from one in perfect health, until emaciation and the other later effects of the malady exhibit themselves. The animal is as gregarious as ever; eats its food and ruminates as placidly as usual; looks as plump, bright and healthy as any sheep in the flock; half an hour later, with looks entirely unchanged, unless in the trifling particular named, it is moving around restlessly and incessantly among its companions, struck by a malady which has transformed the habits of its sex*—which no human power can arrest or even palliate—and which will know no respite until terminated in a miserable death.

The subsequent occurrence and progress of the symptoms, in the cases observed by me, were about as follows: The rabid sheep both exhibited and provoked extreme rage when they were first put in a pen with other rabid sheep; they fought or pursued each other fiercely; but this mood soon subsided in the new comers, and for the next twenty-four hours they remained comparatively peaceable, at least unaggressive, but they were ever ready to fight on being ridden. On the second day the depraved appetite manifested itself, and they began to rub their heads against fences, walls, etc., and to scratch them with their own hind feet, leading to the inference that they were suffering some cerebral pain. The part of the head invariably rubbed was

* At least so in the case of ewes.

that over the parietal bones. On the second or third day the scars left by the dog's teeth looked red and inflamed. The sheep were more restless and irritable; they frequently assailed their companions without any provocation; they fiercely butted, and two of them actually bit at a stick, as often as it was pushed against or towards them. On the third or fourth day they rushed at a man if he entered their pen—bounded forward and dashed against the fence which separated them from him, on his thrusting a stick at them. Three of them thus charged the fence, if only a hat or handkerchief was shaken towards them. Two were so ungovernably fierce at times that they sprung at a by-stander if he uttered a sound or merely approached their pen. They bounded forwards when they made these assaults, most of them emitting that loud, snuffing sound (caused by a violent expulsion of air through the nostrils,) by which rams, bulls, etc., often express their rage at the approach of some strange object. Two of them opened their mouths, gnashing and threatening to bite, whenever they attacked a man or a stick, but I did not see them offer to bite when fighting their companions. On the fourth or fifth day the wounds of a portion of them, more or less, reopened. On the fifth or sixth day they began to exhibit considerable weakness, and most of them displayed less ferocity. No. 1, however, remained indomitably savage to the last; No. 3 remained so until near death; and No. 6, after a temporary lull, became more deeply re-excited and ferocious, and remained so until death. These three last named sheep would rush at a man, a stick, or another sheep, when they were so weak as frequently to fall before reaching their object, and as soon as they could rise they would renew the attack. They and others frequently fought each other when in this condition, constantly falling, and some of them uttering short, bleating sounds, or groaning piteously when they were hurt. Their voices on such occasions were more shrill and plaintive than the notes of the healthy sheep; but the only one I heard utter the usual prolonged bleat, with which sheep call to each other, or to their keeper, uttered it in the natural key; and this was on the sixth day of the disease.*

On the 6th day, one of the sheep began to rub her breech, often and hard, against the fence, and she continued this, more or less, until death. From the appearance of the parts, I inferred this was occasioned by an irritation of the vagina.

Those which exhibited the greatest decrease of aggressiveness, as their strength failed, never resumed the usual timid habits of their nature. They retreated from nothing; and to the last if a man entered their pen and threatened them with a stick, they instantly attacked him.

The prostration of strength progressed with different degrees of rapidity, owing probably to their different degrees of constitutional vigor; but all showed much and rapidly increasing debility by the close of the sixth day. Their respiration was labored and sometimes irregular. The pulse of the one counted rose to one hundred and forty a minute. One became blind in one eye, one in both, and a third partly blind in one eye. The cornea, in

* Their notes were in no case very "much altered" from the usual ones which indicate rage, pain, &c., and the "howl of the dog," said by Mr. Youatt to be "characteristic of the disease," was entirely wanting. I do not suppose, however, Mr. Youatt meant to be understood literally, but merely that the key of their voices was changed, and rendered high and plaintive, as in the case of the rabid dog.

each instance, became opaque and white; but this happend only where wounds of the dog's teeth could be found on the lids or close to the affected eye. At this stage the scabs of nearly all of them dried up, and their wounds appeared to be rapidly healing again. When standing quiet, their heads sunk down low, and they trembled slightly all over, as an animal often does after drinking cold water. Froth exuded in rather small quantities from the front part of the mouths of two or three of them, and ropy saliva fell from the lips of one to the ground.

The last day or two of their lives they staggered in their gait, fell over their dead companions, and rose with difficulty. Finally they became unable to rise. The respiration was more labored and irregular, and, in one instance, stertorous. Their debility was extreme. Even at this stage, and until actually dying, they did not manifest that degree of "stupor" and "insensibility to all that is going forward," mentioned by Mr. Youatt. They looked up when a loud or unusual noise was made, and those which were not blind evidently took notice of objects of sight; and not one of them to the last showed the least indications of becoming paralytic, as the same distinguished author stafes that rabid sheep usually do in England. Neither the appearance of the ground, nor their postures, indicated convulsions or struggling at the time of their death. I saw none of them die.

The five cases which were seen throughout, extended respectively through nine, seven, eight, ten and six days, giving eight days as the average duration of the disease.

While the preceding statement of the symptoms of rabies accords in leading features with that given by Mr. Youatt, there are even more discrepancies between them in detail than I have called attention to. I think it probable that these differences are due in some measure to local or incidental circumstances, such as the peculiar breed, constitution and habits of the animals, their previous keep, etc. In all these respects the American Merino differs widely from the English breeds. The season of the year when the cases were noted, may also have had an influence. And, finally, owing to climate or other undetected causes, the malady may not assume precisely the same form in different countries. But be all this as it may, I at least know that I carefully noticed, and instantly, and, so far as I could, faithfully, recorded the facts seen by my own eyes.*

An anticipated post mortem examination in which an eminent medical gentleman has promised his assistance, has not yet taken place.

CORTLAND VILLAGE, N. Y., *January* 31, 1863.

* I have specially referred to Mr. Youatt's statements, because his work on the sheep has ten and probably twenty times the circulation of any other foreign work on sheep in our county—and he is justly regarded as very high veterinary authority. His experience with rabies in domestic animals probably exceeded that of any other writer on the subject, and he is often cited with great respect by authors on that disease in the human subject. But from the manner in which he cites Mr. Harris's experience and observations in regard to rabies *in sheep*, and his entire omission to convey any intimation, directly or by implication, that he has been an eye witness of it, I am led to infer that he did not describe the disease from his own personal knowledge.

LOCUST TREE BORER.

DR. ASA FITCH.

HON. B. P. JOHNSON: The letter which you forward me, with an accompanying box of insects, from Robert Howell, Esq., of Nichols, Tioga county, N. Y., dated January 27th, brings to our knowledge a fact not recorded before that I am aware, namely, that the locust tree borer, *clytus robiniæ* of Forster, (the same insect which was subsequently named *c. pictus* by Drury, and still later *c. flexuosus*, by Fabricius) which so greatly injures the locust trees all over our country, sometimes establishes itself also in the honey locust, *gleditschia tricanthus*, in which it is thereupon apt to continue until it ruins the tree.

Mr. Howell says he set out two trees of the honey locust in his door yard about twelve years ago. A few years after they were found to be badly infested by borers, which began to throw out their chips or worm dust from the trees each year, about the tenth of June, the worms being then about three-fourths of an inch long and of a dirty white color, with red heads. For a few years past the trees had become so much infested and eaten that numbers of their limbs died, and about the first of August last he cut them down. The larger tree was about six inches in diameter, and its body was completely cut to pieces by holes bored everywhere through it; and about a hundred insects in their pupa state—large, plump fellows, an inch long—were found in it. Some four weeks after, on splitting up the wood for fuel, other specimens were found changed to their perfect state, but dead and more or less decayed. One was obtained perfect which he sends us. Some of its yellow bands are partly and others are wholly obliterated, as they are liable to be in rubbed specimens of this beetle.

I may here remark that my experience has been quite different from that of Mr. Howell. Two trees of the honey locust which I planted in my yard twenty years ago, have been the most clean and free from insect vermin of any of the deciduous trees in my grounds. Though the borer is often present in the common locusts growing around them, it has never entered these trees.

I may add that I have from T. B. Ashton, of White Creek, a specimen of the locust tree borer which he tells me was bred in the black walnut, *juglans nigra*, in Pennsylvania, where it is not uncommon for the larvæ to occur in that tree.

The beautiful miller in the box is the *ctenucha latreillana*, of Kirby, a very rare species, which I have met with only in a single instance, on the last day of June, the day before the date on which Mr. H. found this. No particulars of its habits are yet known.

The other specimens in the box are common species, of which I have nothing to say which is not already communicated to the public.

Yours truly, ASA FITCH.

February 3, 1863.

ON THE BREEDING OF HORSES.

The following valuable article was prepared by Col. H. L. Shields, at the request of the managers of the Rensselaer County Agricultural Society:

In most dissertations upon this useful and indispensable animal, much space is devoted to describing the origin of the horse—the differences between the Darby and the Godolphin Arabian; how they were obtained, &c., &c., subjects which, in our judgment, but little interest the breeder of the present day. We propose, therefore, briefly, to allude to those points in breeding, breaking, training, driving, and the general management of the horse, as shall equally interest all who, either for business or pleasure, use this noble brute. Many of our farmers who yearly raise one or more colts, pay no attention whatever to the size, action, &c., of the mares or stallions they make use of; and many men of business and pleasure who keep horses, knowing nothing of how their animals should be fed, groomed, driven and managed, leave all of these important considerations to the care and judgment of bipeds as ignorant as the brute himself, and far more unfeeling, thus causing heavy losses to owners from their own carelessness or ignorance. It will therefore be our aim to give in a brief space such hints as shall remedy this evil, to all those who will take the pains to peruse this article and remember the contents. First, then, as to

BREEDING.

Under this head it is well to consider the use for which the animal is designed—whether for the road, the coach, the course or heavy draft. No animal is fitted for all these various purposes.

It is desirable that all horses should be of good color, dark bay, chestnut or brown, (with as few white marks as possible,) these colors being best, and indicating more constitution than the lighter colors. Small, lean heads; full eyes; long, tapering necks; sharp, deep shoulders, sloping well back, (for heavy draft some prefer the upright shoulders); large in girth; broad loins; sinewy, flat legs, short from knee and hock to the foot; round, (barrel); dark good sized feet are elements of beauty and usefulness to which none can object.

FOR THE ROAD.

A horse should be about 15 hands high, (a hand being four inches,) measured from the top of the withers or shoulders to the ground, when the horse stands naturally. His weight should be about 1,000 pounds, for such weight in an animal 15 hands high, in moderate flesh, indicates compactness and power *somewhere*. Experience has proved that horses of this size carry their weight better on long journeys, pound their feet less on pavements and hard roads, and are apt to be more fleet than those of a larger class; for while greater length and height will give an increased stride, either running or trotting, the power to gather rapidly, and especi-

ally for long distances, requires much greater muscular exertion in large than in small horses, from the greater weight to be propelled. Our fastest racers and trotters have generally been from this class—Eclipse and Fashion, Ethan Allen and Flora Temple, for example; such, then, are the horses for road, saddle or turf.

The *coach or family horse* should be of larger class—say 15½ to 16½ hands high, and weigh from 1,000 to 1,200 pounds. Such animals, when combining style and beauty, command good, remunerating prices, and it is very questionable if they are not far more profitable to the breeder than the fleeter animals, which require much time for training to acquire the speed necessary to command high prices. The coach horse requires only gentle and perfect breaking—such as the farmer can give while performing his farm work—to command from $500 to $2,000 the pair. To bring a like sum the road horse must show great speed—such as not one out of fifty attains, even after years of training; and if time is money, that consumed in training the trotter must be added to his cost. To insure style, ease of action, intelligence and beauty, the coach horse should have a good strain of the *thorough-bred*, (animals with pedigrees tracing back to the English turf on part of sire and dam, although a term constantly misapplied when speaking of Morgans, Black Hawks, &c.,) and yet retaining enough of the cold blood to give him the heavy tail, mane, &c., never possessed by the thorough-bred horse. Our remarks about color and figure are all-important in the coach horse.

The *draft horse* should be from 15 to 17 hands, and weigh from 1,200 to 1,500 pounds, with short legs, broad, short back, loins and chest, round, solid body, and capable of throwing great weight into the collar, of quiet, easy disposition, rather resembling the patient ox than the restless, nervous thorough-bred.

These three breeds are distinct, and as well might we expect the greyhound, the St. Bernard and the terrier, each, to show the peculiarities of the others' separate natures, as to expect the racer to draw a heavy load of stone, or the clumsy draft horse to show 2.40 to a sulky; and yet such has been the unreasonable expectation of many American farmers and breeders.

We will close our remarks on breeding by describing our model of the brood mares and stallions. Both should be of good color and temper, their ancestry possessing for two generations the same good qualities, if possible—for animals often breed back to a white-faced, white-legged sire or grandsire, dam or granddam. There should be a *moderate proportion* of size maintained, the mare being rather the larger; but the great mistake of breeding a small mare to a very large stallion, and *vice versa*, will probably produce a monstrosity of a quadruped with the large head of one parent and the small body of the other. A reasonable proportion can rarely be realized. That by a judicious system of breeding, horses can be brought to a larger or smaller size, none can doubt; but it should be done in a series of generations, never in one. The same remarks apply equally to gait. Cross a short, quick-stepping Morgan with a long-gaited thorough-bred, and you produce often a mongrel that has a medium length of step and no quickness If like produces like in any point it should be in gait; but both parents should be gaited alike, never *extremely* dissimilar

in this or any other respect. Shorten and quicken, or lengthen by degrees, in three, four or more generations. Especially should both parents be alike in points desirable to retain in the offspring. A brood mare should be roomy, and a *good milker* (for no foal can flourish where the dam gives it no food); both sire and dam should be between eight and thirteen years old. If parents are older, their colts are puny looking animals. Neither should they be overworked. Hard training essentially impairs the powers of breeding, and hence so few of our renowned horses have left worthy successors. The mare should be kept steadily at breeding to develop all her qualities as a dam. First colts are rarely the equals of their successors.

Great mistakes are also often made by our farmers in selection of stallions. To save a few dollars for the services of the horse, they often breed to any inferior animal that presents himself, forgetting entirely that the colt from good stock will remunerate him fourfold for the extra cost of service; after which the expense for rearing a superior and an inferior colt is the same, and while one at five years old commands $500, the other will find slow sale at $125. In our judgment stallions should be selected by properly appointed judges, and no others be allowed to serve mares. Two or three first-class stallions, of proper size, pedigree and action, in each county, would rapidly improve our stock, and would also remunerate their owners for the large outlay necessary to obtain them. In this respect Kentucky is fast outstripping Vermont, while the latter State has every advantage in its clear, cool, invigorating atmosphere, its sweet mountain herbage, while the rough ground over which the colt climbs in pursuit of food, develops every muscle, and gives him feet like flint and sinews of iron. In New York and Vermont, *thorough-bred* stallions of large size are needed to bring up gradually the size, courage and endurance of horses. To prove good stock getters, stallions should be spared from the severe training necessary to develop speed. If of good ancestry and the necessary form, there can be little doubt of the animal's performance if trained. Hard driving takes from him the courage, fire and vigor which should mark the stallion, and even if a little vicious withal, it is no *material* objection in the sire. Very *amiable* horses rarely possess strong constitutions, while the vicious brute is always tough and hardy. Our stallions are often worked to earn their *living*, or trained to trot fast, as such animals only pay in the stud—many presuming that such must necessarily get trotters, while they forget that all the powers of the constitution are taxed to sustain the unmerciful driving to develop speed. The *figure* of the stallion should be closely inspected—short necks, big heads, light limbs, white face and feet, narrow loins, ringbones, curbs, spavins, &c., &c., are all *inheritable*. We yet hope to see the day when stallions will be owned by Agricultural Societies and used for the public good, thus avoiding the miserable degenerate race now infesting the country, and the extravagant prices demanded for the services of the few that are worthy.

TREATMENT OF COLTS.

In the foregoing we gave some general principles of breeding. It is our purpose now to speak of the training and general management of horses. Farmers are apt to go to one of two extremes with their colts—

either to halter them and drag them about through the heat of summer, on roads of all kinds, alongside their dams at work, or else to turn them out to run wild during the first six months of their existence, out of sight and hearing of human beings. Now, we take exception to both these methods of proceeding; to the first, because the limbs and feet of the young animal are tender, and apt to be strained and bruised by being compelled to keep up with the dam, even when walking, for several consecutive miles. The young colt requires frequent rest, and should be at liberty to lie down whenever inclination prompts. When the colt becomes tired it drags on its halter, straining the cords of the neck, back and legs. It is also disadvantageous to allow the young animal to run too long without subjection, for when the attempt is made he will resist with great force and often with injury. At the risk, then, of some extra work, we advise that the colt be accustomed to be handled often, until he has no fear to approach persons, and when they always receive caresses, they are very ready to do so. At two months old, put on the halter; but allow the colt to go very much as he likes, occasionally drawing him towards you and caressing him. In two hours you will have imperceptibly broken him to lead. Then, when you tie him, do so with a halter he connot break—a short struggle will satisfy him he is conquered. Never suffer any one to strike or yell at a colt; one such barbarous act will cause a day's work to overcome its bad effect. When first cleaning him, avoid the head—then approach that part tenderly, and if he resists go to some other point. In a few moments return, and so continue till he submits with pleasure, rather, to being handled and rubbed anywhere and on any part. Your colt is then half broken. Wean the colt at five or six months old, first teaching him while suckling the mare to eat oats. When taken from the dam confine the colt closely, and put them out of hearing of each other for one week. During the *first* winter, feed daily two quarts of oats and all the hay the colt will eat. This with good warm shelter will keep him growing and improving. Don't turn out in spring till the weather is settled and warm, and a full bite of grass. The first year makes or ruins the colt. It is the most important of his life. Keep him *fat* the *first* year, whatever you do afterwards, for this year decides whether he is to be a full grown horse or a miserable pony—no after care can atone for neglect during the *first* twelve months. Good pasture (mountain if possible) the next season and plenty of hay the next winter, with a quart of grain if convenient, will bring you a finely formed, powerful two year old. If a horse, alter him early *before fly time*, and turn to good grass. In the fall begin to break, by bitting gradually tighter each day—within two weeks you have his head as high and graceful as nature allows. The neck should be arched and the face *vertical*, without constraint. When the bitting is accomplished, put on your harness and let the straps dangle around his legs; continue this until he pays no attention to them, but do not fatigue the colt either in the bitting bridle or harness. The bending in of the neck is exceedingly painful and should be done by degrees, the work requiring two weeks. While in the bitting bridle, exercise him on a circle to the right and left, alternately, the radius never less than 10 to 15 feet, otherwise he will learn to step too short. Make him walk, and walk *fast* while walking; no gait is more important,

and our Agricultural Society should offer premiums for fast walkers. While harnessed, accustom the colt to wagons, sulkies, &c., by running them around and about him. Then harness to the sulky and lead him several days until he no longer notices the pushing or jostling of the vehicle. Then let one get in while another leads, and so *gradually* get him accustomed to all around him; on finding he is not hurt he will soon become quiet. Occasionally harness double, with a steady, quiet horse, but put on no load. Teach him to back by standing in front and pressing on the bit—calling out "back," &c. *Always caress when he has done his duty.* During the second winter, hitch in double, making the other horse draw all the weight and drive for a short distance (say one-quarter of a mile at a time) alternately, fast and slow. Train your colts to three gaits in harness, the fast walk always, the moderate or road gait for distance, and the rapid trot. As if we desired to make a man a good dancer, we would begin young, while the limbs were nimble and the actions graceful—so if we desire a fast walker and a fast trotter too, we must take the colt while young, and so, when pressed, he will take up the fast trot, instead of the gallop, so natural in after years. A horse can be trained that he is to trot and not break up, as well as the boy can that he is to glide but never jump in the waltz. We do not pretend that all horses will learn to trot *equally* fast, more than all the boys dance equally well, but all can be trained to exert every muscle in the trot, as well as in the run. Colts should never be driven fast for long distances; they become leg weary and cut themselves, or "interfere" as it is called. At three years old, the horse can perform very moderate work. At four, more still, but not until five should he be expected to do "day's work," and better yet if deferred until six; most horses are ruined *before* five, by early and injudicious driving or brutal treatment of some kind. The *farmer* can best use horses up to this age; all his work can be done by his brood mares and colts, and leave all his *matured* horses for market. One horse thus raised and trained is worth two such as we now often meet, and so the breeder's purse will prove who tries it.

GROOMING AND FEEDING HORSES.

A few words now about grooming and management. Every horse should be thoroughly cleaned each day. The bedding, instead of being thrown under his manger, to fill his food, his eyes and his lungs with ammonia, should be thrown behind him, or out of doors to air. His manger should be *kept* clean and once a week washed with salt and water, and salt left in it. One night in each week he should have a warm bran mash, eight quarts, generally given on Saturday night, as it is somewhat loosening and weakening, and the horse is presumed to be idle on Sunday. Oats are by far the best food, and ground oats wet with water is better than whole dry grain. Cut hay is a great saving, and moistened and sprinkled with ground oats, forms *the best of food.* The hull of the oats is hard and often unmasticated, and passes undigested through the system, thus taking away instead of imparting strength and nutrition. For medium sized horses, with moderate work, nine to twelve quarts of oats per day and fourteen pounds hay are ample. For large draft horses, eighteen quarts oats and sixteen pounds hay. Food consisting of one-

third corn ground with two-thirds oats, form strong, hearty, *winter* food for work or coach horses. But corn is unfit for road or *fast* horses. It is too heating. Good beds and good grooming are as important as good feeding. Horses, like men, want good, dry, warm, clean beds. In grooming tie your horse so he can't bite his manger and thus learn to crib bite, and if you find your groom currying and tormenting the poor animal when tied, so he is uneasy and restless, use your stable broom over the groom's back; it is an excellent instructor to teach him to be gentle. Let the currycomb be very moderately used on the body to loosen up the scurf and dirt, but never permit one near the mane and tail. *Rely mainly on the brush* and rough cloth for cleaning. Banish combs from your stable. They tear out more hair in a day than will grow in a month, and they ruin all the manes and tails that are ruined. The tail should be washed with castile soap and water once every week, and *brushed with a wet brush every day in the year*, holding up the bone of the tail and brushing the hair from you. Half an hour is enough for a *good* groom to one horse, but one hour's time at the outside, ample to be very complete. City horses on dry floors should have cow manure put into their feet once a week, to draw out fever and keep hoofs growing. It should be put in over night and allowed to wear out of itself. To conclude, always be gentle about your horse's body, *especially his head.* "More haste less speed," is peculiarly applicable to grooming and breaking. Use whips as little as possible; use your reason and exercise patience and kindness, and instill by precept and example the same useful lessons in those untutored creatures denominated grooms, and if you cannot inculcate wholesome truths into their heads, you can ameliorate the condition of that much abused animal, the horse, by occasionally exemplifying the power of their own treatment on themselves.

CORRESPONDENCE.

Col. Johnson's Letters from England.

Number 1.

Sumner Place, Onslow Square, London, W. C., *June* 19, 1862.

Dear Sir: After my letter from Liverpool, I think on the 13th, Mr. Cornell and myself visited Speke Hall farm near Liverpool, and examined the herd of Mr. Atherton, who has lately purchased Mr. Bolden's entire herd, among the most valuable in this country. He has the Duchess blood in great purity. Mr. Atherton is to have a public sale in July, which it is probable we shall attend. Mr. A. has an excellent farm, in good order, and his stock is of a high order.

On the sixteenth we visited Robert and Thomas Bell, who are tenants of the Earl of Derby's estate, the one at Mosboro Hall (Robert) who has given up breeding stock and has his farm devoted to the milk dairy. We found his farm in good order and everything about him indicated the skillful manager. Thomas Bell has a farm on same estate of about 300 acres. He has a small herd of Short Horns, descended, I believe, from the Bates' stock, Mr. Bell being one of his nephews. He sells at moderate prices and has a demand for all he breeds. His farm is rather light land for Short Horns; it is apparently well managed. We visited the same day, Mr. C. W Harvey, Walton-on-the-Hill, about five miles from Liverpool. He has an excellent lot of Short Horns, mostly of the Kirklevington and Barrington tribes. His cattle were in good order as well as his farm and buildings. His cows are large milkers. He has a milk dairy and sends milk to Liverpool. His cows are mainly Yorkshire, sired by a Short Horn bull, and are large bony cows, giving very large quantities of milk, and are usually kept up in the stable until their milk fails, when they are fattened for the shambles and their place supplied by others.

Mr. Harvey is a merchant in Liverpool, and attends to his farm and stock personally, and he is succeeding well both in reference to stock and farm, in a manner that must be gratifying.

On Tuesday the seventeenth we came up to town, and on our arrival at the city about nine P. M., I found a letter awaiting me from H. Strafford, Esq., inviting us to the closing sale of Jonas Webb's world-wide known South Down flock the next day at eleven o'clock, at Babraham. We were enabled to reach a special train at nine in the morning of the eighteenth, and arrived in time for the sale, with Mr. Cornell and Mr. John Dagwell, of Utica, a friend and fellow passenger with us in crossing. We found a remarkably fine lot of yearling lambs, the last of the Babraham stock. A large company of intelligent farmers and others were present, not only from England and Scotland, but also from France, Austria, Hungary, and

I think Silesia, who were among the purchasers. There were 149 bucks, fifty-eight pens of ewes of five each, sold, and the work was most admirably done by Messrs. H. Strafford and J. Carter Jonas, and we had time to return to town, forty-five miles distant, that night. The sale was rapidly carried on, not a controversy arose as to bids, and everything was in complete order. An interregnum of an hour for a lunch, such as we do not not often see in America, at which Mr. Strafford presided, enabled us to stand the fatigue of the day. The sale was a capital one, the particulars of which you will find in the *Mark Lane Express* next week. Mr. Cornell bid off nine bucks and three pens of ewes, and the animals will do credit to his judgment when they reach our shores. The highest price buck was 140 guineas, and the highest pen of ewes, I think, twenty and a half guineas each. The whole amount of the sales last year,

967 sheep	£10,926	6	6
This year, rams 148, ewes 289=437	6,720	8	0
	£16,646	14	6

The largest amount ever realized for a sale of stock by one individual, I believe, to be found on record.

On my arrival here on Tuesday evening, I found an invitation to Dr. Murchison's, which I attended with Dr. Black, where I met many of the members of the Scientific Convention and several old acquaintances of 1851.

To-day I have been at the Palace for the first time. The building is of a permanent character and not as attractive as the Crystal Palace of 1851. Its internal arrangement is much to be preferred, and the exhibition far exceeds that of 1851. Of course a rapid view does not enable me to form any judgment of it as a whole, but in every department the advance was most striking.

Mr. J. E. Holmes, the assistant commissioner United States, has done wonders in arranging our few articles and preparing our department. He is entitled to great credit both from exhibitors and our country. The commissioners of the exhibition have treated us most kindly, and I find a welcome on every hand which is most gratifying.

The *Times* and other papers have noticed our articles with commendation, and the jurors, who are about concluding their labors, have given, we are assured, a liberal award of medals to our department.

In passing through the country from Liverpool to London and thence to Cambridge, the crops appear upon the whole very good, and there has been great improvement since I was here in '51.

On Thursday we visited the exhibition, and I was most cordially welcomed by the commissioners, and was glad to find that Mr. J. E. Holmes, our acting commissioner, had performed wonders in the arrangement and disposition of our articles. We had five jurors, most efficient men, and I believe all of our articles received attention; and, as the jurors close their labors to day, the awards will be known early next week, and we are assured that our contributions will receive a fair share of medals.

Every possible attention has been given to our department by the royal commissioners; and Prof. Owens, who has charge of the foreign department, has laid us under obligations that we can never fully repay, by his

constant endeavors to provide a proper place for our articles. And when it is recollected that we did not have our goods here until long after the time for reception had expired, it may be seen how much we are indebted to him for favors received.

I called on the Secretary Royal Agricultural Society, Mr. Dare, and every attention was given to us, and we were most cordially desired to be present next week at the opening of the Battersea show. It promises to be *the* show of the society, and I will furnish you as early as practicable an account of the exhibition.

The exhibition in the building exceeds far all my expectations—progress everywhere is most manifest, and the world has moved in every direction since 1851; most, I think, in the machinery, implement and manufacturing departments, though a great advance in the art division. I hope to be able to furnish you with some description of the implement and machinery department soon. B. P. J.

THE ROYAL SOCIETY'S LONDON MEETING.

Number 2.—a.

A private letter from Col. Johnson, dated London, June 28th, incloses to us a copy of the London *Times*, containing a partial report of the great Metropolitan meeting of the Royal Agricultural Society of England, held at Battersea Park, London, in connection with the Highland and Agricultural Society of Scotland. Col. Johnson writes:

"This great show exceeds by far all my expectations, and, so far as I learn from day to day, the anticipations of all. The show of stock is wonderful—the Short Horns pre-eminent in every direction. The other classes have fine animals, and the foreign stock adds much to the show. Sheep and pigs first rate; but *fat reigns* on every side. The first prize bull noticed in the *Times* is utterly unworthy of the prize, and I have not heard *a voice in his favor* except the judges'. Horses excellent. Implements a great advance since 1851.

"I go to-morrow to dine with Mr. Caird; and on Tuesday, with the foreign commissioners, visit Mr. Lawes' farm at Rothamstead. I have seen Mr. Read, of Norwich, Mr. Bass, and others of your friends, who desire a kind remembrance; * * * and have also arranged for a tour in the Lothians, &c., as soon as I can get time; just now the exhibition, as well as the Royal, presses very much."

The Duke of Devonshire's "Lord of Oxford," purchased of Mr. Thorne, was shown in the same class in which the decision of the judges appears to have excited so much and so unfavorable criticism. The *Times'* reporter, for example, says:

"What claim to distinction Mr. Wood's first prize white bull can urge, is a secret which the judges (of unimpeachable judgment in most of their other awards) have unaccountably succeeded in discovering. Booth blood is a grand thing in its way, but cannot compensate for the obvious demerits of a miserably *narrow chine, flat sides, defective loin*, and some *other bad points*, which, in spite of several excellencies, pertain to this clearly misplaced bull."

To the above, we subjoin the following extract from a letter subsequently received from Col. J., under date of June 30:

"The exhibition is going on sucessfully and is truly astonishing. Every day's examination reveals new beauties in the various departments.

"The first four days of the week being shilling days, there is no opportunity of seeing anything. From 40,000 to 70,000 people crowd every avenue, and when night closes their labors they can say, 'we have been to the exhibition,' but literally they have not seen any one thing to advantage.

"It is in all its parts the greatest exhibition ever before made; and although the United States have but few articles, we have many very valuable things which are attracting attention; but we are not represented as we should have been had our government appropriated for the expenses.

"The great cattle and implement show of the Royal Society is exciting immense interest, and is the best and most extensive show ever held, both in the cattle, sheep and swine classes, and in the machinery and implements. The exhibition continues two weeks; and this week being the shilling days, the ground will undoubtedly be crowded to overflowing."

Number 2.—b.

PARIS, *July* 31, 1862.

MY DEAR SIR—I have been in Paris ten days, and have found my time occupied with the beauties and attractions of the city, which have very largely increased since I was here in 1851. The Emperor is improving the city in every direction. Splendid parks, streets and buildings arise as if by magic, and the ever uneasy population of Paris are attracted with something new and wonderful every day, and are thus kept engaged so as to have no time for revolutions.

I have found employment more useful and important than mere sight seeing. Mr. McCormick, of Chicago, and Mr. Griffin called on me last week to attend a trial of reapers, at the Agricultural School farm at Grignon, about 25 or 30 miles from Paris, to take place on Saturday last, under the direction of the Imperial Societe d'Agriculture of France. My engagements were such that I could not then decide to attend, but circumstances unexpected enabled me to do so, and on Saturday, with Mr. and Mrs. Osborne, of Auburn, I went to Grignon. We went to Versailles, 16 miles, by rail, and from there by carriage. Versailles has one of the oldest and most noted palaces and parks in the kingdom. We had a ride through the park going and returning, which enabled us to see most of its attractions, and they were many I can assure you. The country from Versailles to Grignon was a strictly agricultural one, and the crops were much the best we had seen in France. The wheat crops were splendid—equaling our famous Genesee valley crops in the best days of wheat growing. The fields on either side, as we traveled on, stretched away to gentle rising uplands as far as the eye could reach, and presented a prospect rarely seen. No fences marred the scene. The variegated crops over the whole expanse gave a beauty I have never seen excelled. The country lay before us like a beautiful carpet, with its various colors, attractive to the eye—wheat, barley, oats, clover, red and dark trefoil—a most beautiful crop in

the picture; English and poled beans, peas, potatoes, and vast fields of sugar beets, of a luxuriance I had never before seen. On either side of a fine macadamized road, as level as the most neatly cultivated walk, were fruit trees almost the entire distance. Pears in such profusion as I have never before seen; apples in abundance; grapes trained to walls in great profusion; and occasional fields in which orchards were seen, all indicating a most successful crop. The laborers in the grain fields, with their rude implements at work—generally old men and females—the young men, I presume, in the army to sustain the glory of La Belle France in Mexico and Cochin China.

There is great objection on the part of the laborers to the reaping and mowing machines and improved implements generally; and they would probably say, as did a Scotch laborer a few days ago, on the arrival of one of our American reapers in Scotland, "I wish the domned thing had been sunk on the way over." Yet it is a fact, everywhere the improvement in agricultural implements has upon the whole given more labor and employment to the men devoted to the work of the farm.

On our arrival at the farm, we found the reapers in operation, though nearly through their labors. The wheat was in fine condition, the ground level, and the grain was well laid by each of the three machines in operation, viz: McCormick's new self-raking reaper from Chicago; Burgess & Keys' McCormick of 1851, with their self-delivering apparatus, and a one horse machine of Wood's construction (American); but the last two were made in Paris, I believe. McCormick worked his with two horses, and with great ease. I went round the grain as it was cutting, and the machine operated admirably, with great ease to the team, and the raker cleaned the platform at each revolution better I think than I have ever before seen. Burgess & Keys' worked with three horses, and they evidently labored much more than the team on McCormick's. The one horse machine cut only scant three feet, and did not lay the grain quite as well as the others, and the horse labored severely.

I devoted what time was left to a hurried examination of the Agricultural school buildings, which are very convenient for the purposes of the institution, and all the arrangements seem well calculated to do good. The stock, implements, and all the internal arrangements appear well arranged. As I expect to receive from Dr. Bella, the principal of the school, a detailed account of the operations at Grignon, I will omit any further remarks here.

Yesterday being the usual day of meeting of the Imperial Agricultural Society, I attended the meeting with Mons. A. Vattemare. I was very cordially received by the Society, and had the opportunity of listening to some very interesting papers and reports which were presented to the society. My friend Vattemare gave me the substance of the reports as read, so that I obtained, notwithstanding my little knowledge of French, a fair understanding of the subjects brought before the society. The chairman of the committee on the trial of the reapers made their report very full, and were decidedly favorable to McCormick's, both on account of its lightness of draft and the manner in which the raker performed its work.

M. F. E. Guerin Meneville exhibited cocoons of a newly introduced silk

worm from China, (1858) which feeds on the foliage of the ailanthus tree. It seems to be successful, and there is great hope it will be. A society has been organized, I believe, to forward the work. I am promised by Mr. Meneville some of the cocoons, and shall endeavor to take such care of them as will secure their safe arrival in our country. There were other matters before the society, but these appeared to be of the most interest. I expect to visit to-morrow the farm of the late M. Vilmorin, where his experiments with grain from every country and clime have been so faithfully carried out, to the great advantage of his own country and the world. Mrs. Vilmorin, I believe, continues the work her lamented husband so ably sustained during his lifetime. B. P. J.

Number 3.

CITY OF YORK, ENGLAND, *August* 4, 1862.

MY DEAR SIR: I am here attending the fair of the Yorkshire Agricultural Society. In the International Exhibition crowds continue to throng every avenue on the shilling days. Since the awards were announced the crowd find their way (as in 1851) to the American quarter to see the curiosities we have, but could not do it until the London *Times* led off as before. The annexed extract from the *Times* of the first August, shows how completely we have triumphed.

"There was nothing specially worthy of remark in the visit of yesterday. The total admissions were 55,699, of which 5,876 were by season tickets, and 49,823 by payment. There was a large proportion of country visitors, as was sufficiently evidenced by the dense crowds around the jewellers' cases. The Great Western railway alone, we are informed, brought upwards of 4,000 exhibition excursionists to London. No part of the building is ever more crowded than that in which the machinery in motion is displayed, and yesterday the temperature in this portion of the exhibition was, what between the heat of the weather, the heat of the steam, and the crowd, literally almost stifling. A very simple and inexpensive arrangement would at once obviate this source of inconvenience, which is rather aggravated than relieved by wetting the floors.

"After the models and gigantic engines in the Western Annexe, *the very ingenious small hand labor-saving machines in the American court are the most looked after.* One of the most curious of these is the machine for milking the four teats of a cow at the same time, and in a manner precisely similar to the action of the calf's mouth upon the teat. In point of time, labor, and cleanliness, the operation of the machine is said to far surpass milking by hand; and the right to use the patent in this country was yesterday sold, we believe, for a very large sum. In this court, also, is a very ingenious machine for making paper bags, which turns them out folded, packed, dried and finished, at the rate of 40 a minute. The cork cutting, 'planting,' and rope making machines here, are especially worthy of minute examination; and some of the washing machines are quite marvels of inventive skill—almost approaching to the inspirations of genius in the simple means by which their great results are effected. *This court is worthy of even a more extended notice than it has yet received from the mass of visitors.*"

Had our whole entries prepared at Washington come over, as they would have come had the small appropriation been made by Congress, we should have taken the lead in the machinery and implement department, and in new inventions, over the combined exhibition of all the other nations. This is freely acknowledged by those who best know what is exhibited, and who have been advised as to the articles which had been duly entered; and, as it is, we have more new inventions than any other nation, as our awards most fully show, and as is admitted in one of the leading journals, whose article I will send you. This exhibition, on our part, would also have been the best representative we could have had here, and I should have wanted nothing better to show the world, here represented, what our country really is, and what are her resources. There would have been no cry for *intervention* then.

We are constantly annoyed on the arrival of each mail steamer with a telegraph from Queenstown of disasters to our cause, trumpeted through the *Times* and other like journals in this country and in France; and although *contradicted* when the full news comes in the mail, this last never overtakes the other.

I trust the country is aroused with a determination to bring this war to an end. Let nothing prevent this unless He who rules all our destinies should desert us, as I trust will never be.

I feel, and so do most of our Americans here, an ardent desire to be at home and take part in this conflict. Old as I am, I would not hesitate to do it. Never could any patriot or friend of free institutions wish for a nobler object for which to peril life and all. I trust this is the feeling with you; and may God bring to a speedy end this conflict, and show the greedy despots who are waiting to raise the cry "*your republic is a failure*," that they are mistaken—the land of the free and the brave is still triumphant—and be enabled to sing,

"And ne'er shall the sons of Columbia be slaves
While the earth bears a plant or the sea rolls it waves."

B. P. J.

Number 4.

THE YORKSHIRE AGRICULTURAL SHOW.

York, *August* 7, 1862.

My Dear Sir: I came down here on Monday the 4th inst., with Mr. Osborne of Auburn, to attend the meeting of the York Agricultural Society, one of the oldest and most important agricultural societies in the kingdom. On our passage here we found the harvest being gathered in the counties near London, and the crops tolerably fair. As we approached the north the grain was not yet ripe, and the farmers were preparing their fields for the fall sowing. The neatness which so generally prevails in the farming operations in this country was apparent on almost every farm, and the country was in its finest dress. We arrived here, after a four hours' ride, at two o'clock, and went to the show grounds adjoining this ancient walled city, which dates its foundation from the earliest period of English history. A description of the city itself, with its celebrated cathedral, York minster, its castle, its museum, its ancient buildings, remaining as built centuries

ago, would form material for description, which would of itself be of interest; but as my object was to witness the progress of agriculture in its various departments, I shall confine myself to a brief description of what came under my observation here. The show grounds were neatly arranged and well filled, especially with machinery and implements of the most approved kind used in this country, and they showed a very great improvement over those in use here in 1851. It was apparent that the exhibition of 1851 had made its impress upon the English implement makers, who had profited largely by the American contributions at the, Crystal Palace in 1851. Instead of the heavy, cumbrous engines, carts, plows, drills, &c., a much neater, lighter article was seen, and various alterations adapted to the comfort of the farmer were apparent. The mower from our country has made a striking change; they are here in great numbers, and are coming into general use in every part of the country. When our reaper was introduced here in '51 to the astonishment of the whole country, I was told we could not introduce the mowing machine, of which we gave them some indications at that time, but *here they are*, and Wood, of Hoosick Falls, New York, Allen's mower of New York, the Buckeye mower, Kirby & Osborne's of Auburn, Tremain's of Fayetteville, and others are here with the stamp of their different firms, all manufactured in our country, and some of them having very large sales at very desirable prices. It is rather singular that our manufacturers can build their machines and send them here and sell them, cheaper than machines manufactured here of equal quality. Our timber is so much better than that in use here generally is one reason probably, and there are other obvious reasons to a mechanic also, which produce these results. There are quite a number of American machines made here, some with alterations and improvements, but, I believe, few orignal machines.

On Tuesday a trial of steam plows and mowers came off about four miles from the city. The day was favorable, and the trials excited much interest. The steam plows of Fowler, who was the original inventor with Smith, of this method of plowing, and of the Messrs. Howards, were the only ones on trial. It is claimed that the following facts may be considered fully established:

"That for the hard work of the farm, steam is a cheaper power than horse power. That deeper and more efficient cultivation is obtained. That it enables the farmer to perform his tillage operations at the best season of the year. That better crops with less manure can be obtained, especially on clays and loams. That the land may be more quickly and effectually cleaned and freed from weeds. That tenacious soils are rendered more friable and porous, good drainage is promoted by stirr ng the subsoil and breaking the 'pan,' and that open furrows are unnecessary, even on the strongest land. That the steam plow, cultivator or drag harrows may be frequently worked to advantage in an unfavorable season, when it would be impossible to work with horses. That not only a considerable diminution in the number of horses employed can be effected, but that the horses which are still necessary can be kept at less expense.

"With respect to the way in which Fowler's steam plow is worked, it may be remarked that on the headland were the engine and windlass, and

directly opposite to them an anchor, which is self-moving, and between these the plow was pulled backwards and forwards, one end of the plow being alternately in the air and the other in its work, thus avoiding the necessity of turning at the headlands. The plow being constructed with patent slack gear, the rope is lengthened or shortened as the irregularity of the field requires, and at the same time both ropes are kept sufficiently tight to prevent them from trailing on the ground, by which means a great saving of draught is effected, and the wear and tear (which must necessarily follow from the rope running on the ground) is entirely avoided, without the least diminution of the power of the engine. It is stated that in working by this plan a field of any size can be begun and finished with the smallest quantity of rope and labor, whereas, with a stationary windlass, of whatever kind, as soon as ten or twelve acres are finished, horses have to be fetched, and either the ropes and anchors or the engine and windlass removed, thus causing loss of time and increasing the labor of the men, which is sure to prevent a good day's work being accomplished. Mr. Fowler had two engines on the ground, one being an engine and patent windlass combined. With this the scarifier or cultivator was worked—an implement which, it is said, will cultivate from sixteen to twenty acres per day. It is so constructed as to bear the strain of a fourteen horse engine in any class of scarifying operations, and when doing light work, a harrow may be pulled behind it, thus saving time and labor by doing two operations at once.

"The engine and windlass of Messrs. Howard are stationary while in operation, and they state that during the present year they have taken out three additional patents for important improvements, which will effect a saving of power, add to the durability of the apparatus, and greatly reduce the wear of the steel ropes. Their newly patented apparatus is adapted for hilly as well as flat land, and for irregularly shaped as well as square fields. Forty or fifty acres of land can be advantageously cultivated without any removal of the engine or windlass. From seven to ten acres per day can be broken up with an ordinary eight or ten horse portable engine. The engine requires no alteration whatever, and is available for thrashing, grinding, &c., when not required on the land. It will thus be seen that whereas, according to Mr. Fowler's plan, the engine is moved along the headlands as the work proceeds, Messrs. Howard's engine and windlass are stationary."

The plowing by both of these machines, so far as the work was concerned, was a decided success, but it cannot be adopted on ordinary farms until a decided change is made, and the complicated arrangements simplified, the expenses greatly reduced. As the machinery now used requires so many attendants, it is very obvious that a change must be made to bring these steam plows into general use. On large estates as are held in some portions of this country, it will doubtless go into operation But steam plowing is now a fixed fact, and we look to our country for an adaptation of it to practical use in our farming districts. On the trial, Fowler's four plows completed an acre in one hour. Howard's three plows a less quantity of land. The scarifiers and cultivators operated very well.

The mowers were tried after the plows had been tested. There were

thirteen entries. Eight machines competed, and the work of several of them was excellent. Some failed to do their work. The prize was awarded to *Wood's U. S. Mower*, the same which took the prize last year at the Royal Agricultural Show at Leeds.

The first show day in the yard, Wednesday, showed strong indications in the morning of English weather, which had been fully developed during the preceding night in a tremendous shower, but as the day advanced it partially cleared away, and with occasional sprinklings the day passed off very well. This being the 2s 6d day the attendance was not very large, but still enough to annoy the judges. The cattle were brought into a ring and examined by the judges without molestation. This, I understand, has always been the practice of this society, though at the Royal it has been lately introduced. It is the same practice adopted by our society for several years and with manifest advantage. There were eleven classes of cattle, and all examined by the same three judges, who commenced their labors at nine o'clock, and with an hour respite for lunch completed their labors. The judges had two assistants, one to take down the decisions in each class for the secretary to enter as soon as made, the other to affix the badges of merit, and the work is thus closed up with dispatch, and far more satisfactorily than under our practice.

The same regulations as to horses, sheep, swine, implements and machinery prevail, and the whole work was completed on Wednesday, and the awards all published in a York paper Wednesday evening, and were handed round at the dinner of the society which commenced at five o'clock and closed about nine. There were only sixteen judges in all. In our society the number usually appointed exceeds two hundred. I think here is a place where improvement could satisfactorily and economically be made, both to the advantage of the society and the exhibitor. To do this it would be necessary to adopt another practice in use here; all the entries to be made several days before the meeting, and a catalogue printed of every entry, and ready for judges and exhibitors at the opening of the exhibition. The plan here works well, and I do not see why we cannot avail ourselves of it, so as to improve our system.

The show of cattle, as was expected, from Yorkshire, the home of the Short Horn, was most excellent, no other breed of animals being shown except in the fat and in the dairy class. Among the nine classes of Short Horns I think there was not one really inferior animal shown. This is as it should be. There were some animals of great excellence and the contest in some of the classes very severe, requiring much time to enable the judges to decide. As a general rule I think the decisions were approved. It was apparent that *Booth* blood predominates here.

Yours, B. P. J.

Number 5.

LIVERPOOL, *September* 5, 1862.

I propose to give some account of a few places visited to which I have not heretofore referred.

I visited Mr. J. B. Lawes' experimental farm at Rothamstead, Berks, July first, with Mr. Cornell and Judd, of New York, and foreign gentle-

men representing with our party eight different nationalities, Austria, Italy, Russia, Germany, Baden, France, Sweden and the United States, comprising upwards of twenty in the party, and a more intelligent party it has not been my privilege to meet since my arrival here. We were met at the Harpenden Station, on the Great Northern railroad, by carriages furnished by Mr. Lawes, which conveyed us to his well ordered establishment, where we were met by Messrs. Lawes and Gilbert, who showed us every possible attention, enabling us to become entirely familiar with the great work in progress there, unequaled in any other portion of the world, so far as I am advised. The experiments made by Professors Lawes and Gilbert on various kinds of grains and grasses, with different kinds of manures, were commenced, we believe, as early as 1845, and are still in progress. The great value of these experiments arises from the fact that Professors Lawes and Gilbert, as we understand, have no *particular* theories to establish, but they endeavor to establish results from actual experiments, continued for such a length of time as will establish principles which may be carried into practical use by the farmers. In this way *science with practice* unites to accomplish results that can in no other way so far as we can see, be established. We were taken to the laboratories where the work is performed, and the museum of Prof. Lawes contains all the results of the various analyses which are made from time to time, and which have been given to the world by them. From the laboratory we went to the different fields, where, together with samples of the various kinds of grain grown on the trial plats, we witnessed the experiments in the field which were being carried on upon *grasses, wheat and barley;* and the explanations given as to the results of the various seasons during which the experiments have been carried on, were in the highest degree instructive. The gentlemen who were with us were most, if not all of them, men of science, who took a deep interest in the examinations which were made, and who were competent to decide upon the great importance to the agricultural as well as scientific world of these experiments, which were made with so much care, and which have been spread before the world in the reports which have been made by Profs. Lawes and Gilbert. Most of these have been published in the Journal of the Royal Agricultural Society of England, and several of them in the Transactions of the New York State Agricultural Society, in the volumes for 1857, 1858, 1859, 1860, to which I would refer those who are desirous of becoming familiar with their experiments, which I deem of the greatest value to agriculture in its future advancement. The following papers have been published in our Transactions: "On the growth of *barley* by different manures continuously on the same land, and the position of the crop in rotation," vol. 17; "Experiments with different manures on permanent meadow lands," vols. 18, 19, 20.

These experiments have been carried on, we understand, mainly at the expense of Mr. Lawes, and have amounted to a very large sum, more, we are informed, than has been expended by any other single individual for like objects.

The examinations made by the gentlemen present were most thorough, and all were satisfied of the fidelity with which these experiments have

been conducted. After concluding the examinations, we were invited to the residence of Prof. Lawes, where an English lunch, and such an one as no other country gives but England, was placed before us, of which we partook in a manner which we presumed satisfied our host that we appreciated this liberal provision for our comfort. At the conclusion of our repast, Mr. Judd, editor of the *American Agriculturist*, New York, moved a vote of thanks to Professors Lawes and Gilbert for the rich treat which had been afforded us, accompanied by some very appropriate remarks as to the great value of the experiments made at Rothamstead, which were appropriately responded to by Professors Lawes and Gilbert, who returned their thanks to the gentlemen present for their attendance to make themselves familiar with their operations for the benefit of mankind and for the advancement of one of the most important interests in which every portion of our globe was interested, the development of the agricultural resources of each, on which we were all dependent, and on the prosperity of which depended the advance of every civilized country in the world.

As the time for our return to London had arrived, we bid adieu to our kind entertainers, well satisfied that this had been the most valuable day to us which had been expended since our arrival on these shores, where there was so much on every side to interest us. We had long desired to make this examination, and very gladly embraced the opportunity to make us personally acquainted with these distinguished gentlemen, with whom we had for several years enjoyed a most interesting correspondence, and whose labors, in fact, we had spread before the farmers of the United States to bring forth fruit that will never perish, but add immensely to the prosperity and wealth of our country. Long may they be spared to proceed with the good work which they have carried on thus far so satisfactorily, and with results of such immense importance to the agriculture of our world.

Should we find time, we shall continue hereafter our remarks upon particular experiments made by these gentlemen in other directions, of very great importance. B. P. J.

Number 6.

Subsequently to our visit to Mr. Lawes, we had various opportunities of visiting some of the herds of Great Britain, and some trials of the reapers and mowers from the United States.

We went with Mr. P. Tremain and some gentlemen of the Spanish commission to witness the trial of Russell and Tremain's reaper, from Manlius, New York. This machine has an entirely new and simple device for operating the knives of harvesting machines *without cog gearing*, which consists of a series of rollers placed on the inner surface of the driving wheel, which, when the wheel revolves, run on the flange of a screw or worm attached to the crank shaft; the passage of each roller causing one revolution of the screw and crank. The grain on which the machine operated was not very heavy. The team used had never before been attached to a reaping machine, but the work was well done, in good time, and to the satisfaction of the gentlemen for whose special benefit the trial was had; and to the entire satisfaction also of the gentleman who kindly

proffered his grain for the trial. We consider this an entire success. The owner of the grain drove the horses himself a portion of the time, as did the Spanish gentlemen; and all were satisfied of the ability of the reaper to do the work which had been promised, as well as with the ease with which it was managed. We believe Mr. Tremain disposed of all the machines he had with him, and has secured an agency in England, through which they may be obtained by those desirous of bringing them into use.

CAPTAIN GUNTER'S HERD OF SHORT HORNS.

At the show of the Yorkshire Agricultural Society, one of the best local exhibitions in England, we met Capt. Gunter, the distinguished breeder of the celebrated *Duchess tribe* of Short Horns, at Wetherby, and made arrangements to visit his herd at a subsequent day with Mr. Cornell, the President of our Society. A few weeks after the Yorkshire show we went down to Wetherby, but Capt. Gunter was unfortunately absent. We, however, were shown the valuable herd by his herdsman, and found some extraordinary fine animals, which have a world-wide reputation as prize winners. Most of them were in very fine condition, and all of the females in breeding condition. A few of the most valuable ones were preparing for the show yard, and had more the appearance of animals prepared for the great Smithfield fat cattle show than breeding animals, but this is to be seen everywhere, in the animals preparing for the prize shows. Efforts have been made to have cattle shown only in good breeding condition, but as yet, so far as our observation extends, *fat* rules in all the exhibitions; and as, by the rules of their societies, the premiums are not paid until the females produce a *live calf*, it not unfrequently happens that the prizes are never paid, as no *produce* is given, or a dead calf is the result of this forcing process. To us it is most manifest that the course pursued in England with their very best stock must eventually ruin their best animals; and our advice to all our purchasers of breeding stock from England is, never to buy a *prize animal from the show yards.* The expenses attending the preparing an animal for the prize shows we heard mentioned as probably amounting to £200, a rather expensive operation. In the herds visited by us, where the animals in our judgment were the best adapted for healthy and vigorous offspring, we found the animals in good healthy condition, without being loaded with fat, so as to be scarcely able to walk from the cars on which they were conveyed to the show grounds. Since the Royal Agricultural Show at Battersea, the English papers announce the death of three cows or heifers which had been shown at the exhibition at Battersea; and I recollect distinctly noticing those animals as being so overfed as in all probability to be useless for breeding purposes. Unless an improvement takes place in this particular, many of the choicest herds in Great Britain will deteriorarate or die out.

Mr. Cornell and myself were desirous of purchasing some of the young stock of Capt. Gunter. The animals we desired were quite young, but very superior. At a subsequent day Mr. Cornell saw Capt. Gunter at Wetherby; but the prices asked were far above our mark, and we had to leave them, probably to find purchasers from some Australian gentlemen

who might differ with us as to the number of guineas desirable to be invested in these truly splendid Duchesses. Capt. Gunter has been very successful as a breeder, and as a prize winner in the various fairs of the kingdom; and his herd is worthy in our estimation of the honors which have been won. He had not shown this year at any fairs up to the time we left.*

We felt desirous of introducing some of this celebrated herd to this country, which would have been advantageous to our herds; but we could not advise the payment of such prices as the captain deemed a fair return for these valuable animals.

Races.—After our examination of Capt. G.'s herd, and before Mr. Cornell saw him, we went to York, where the races were being held; as the captain, with the neighboring gentry, was in attendance there. We were not able, in the great crowd present, to find him; but we had the opportunity of witnessing all the paraphernalia of an *English race course;* and such an assemblage of people as is here brought together can nowhere else be found—from the most distinguished nobleman, members of government and of parliament, wealthy men of the higher classes, down in successive grades until you reach the multitude of gamblers of all classes, the most depraved of all other classes, pickpockets, gypsies, &c., compose the attendance upon the great racing week.

We witnessed several races. Some of them were very well run; but we rather thought it was somewhat risky business to bet upon these races, when, according to our ideas of matters, quite as much depended upon *the jockey* as upon the *horse* as to which was to be the winner; and then it struck us that a *liberal supply of guineas* to a *jockey might prevent the best horse from* carrying off the prize, which would carry many more guineas to the pocket of the briber than he gave to the jockey riding his competitor's superior animal. But racing is an English institution, which will continue notwithstanding these or other matters which often cause sad results among the competitors and betters at the races. It is claimed that these races are necessary to *improve the breed* of horses; and, if rightly conducted, they may do so. And perhaps, even as they are conducted, they may accomplish it to some extent; but whether all the evils connected with these races might not at least equal, if they did not overbalance, the benefits, may be a question on which much can be said on both sides. One thing is certain, however; they *draw the people in every country;* and when horses are brought into the ring to test their speed, the *people will be there.* Let us, then, endeavor to make them as little objectionable as possible, and accomplish the most benefits that such trials, rightly conducted, may give; *but never have them connected with our agricultural exhibitions.*

B. P. J.

London Exhibition.

Among the curiosities which attracted great attention, was one of the smallest watches ever made. Its size was less than an ordinary pea, per-

* We learn, since our return home, from the English papers, that Capt. Gunter exhibited at the local fair at Wetherby, and was successful in carrying off two prizes with his twin Duchesses, and some others.

fect in every part, and was set in a lady's finger ring. It runs six hours on being wound up, and is valued at £250. It has been probably sold to some wealthy gentleman or lady, who earn notoriety by being announced as purchasers of those expensive gems. It is said that the sales of most of the very choicest articles in the exhibition, comprising almost every article of interest, have been very large. We are glad of this, as it will repay many an exhibitor for his toil and labor, as well as remunerate him for the expenses attendant upon the exhibition, which, with the strictest economy, are very large.

Steam Plows—Mowers—Agricultural Show of the Yorkshire Agricultural Society.

York, England, *August* 6, 1862.

L. Tucker & Son—I arrived at York on Monday, the 4th instant, and made acquaintance with some of the officers of the society at the show grounds, and was advised of the trial of steam plows and mowers at Stockton, some four miles distant. I went up with Mr. Osborn, who had his combined machine and mower to be entered on Tuesday.

The steam plowing was first in order—only two of the machines being on the ground, Fowler's and Howard's—the manner of their operation having been given, I believe, in the "Country Gentleman." Fowler operates four plows and Howard three. So far as the plowing is concerned, it was well done by each, but which possesses the advantage of simplicity and expense, will be decided in the report of J. C. Morton, Esq., who has the matter in charge, and who is in every way competent for the business. Mr. Fowler's plows were operated by an eight-horse power engine—the engine and windlass being stationed on the headland, and opposite to them a self-acting anchor, between which the plow is pulled by means of a wire rope, backwards and forwards, one end being alternately in the air and the other in the soil, thus avoiding the necessity of turning the headlands, which is a very good arrangement. The Messrs. Howard's machine was worked with an ordinary portable engine, with detached windlass, worked by a connecting rod, which seemed to be a good arrangement. It is a three-furrow plow, and from its simplicity, its motions are very easily controlled by the man having it in charge. The machines, after the preliminary trials, were started for an hour's trial of speed. On the expiration of the time, it was found that Fowler's plow had plowed exactly an acre in the hour. Howard's, in the same space of time, with a ten-horse engine, had plowed fourteen chains twenty-three links, and fifty-three links in width. The work was well done, but each of the plows had their advocates. Mr. Morton's report will give the results.

At the close of the plowing there was a trial between Mr. Fowler's machine as a digger or scarifier, and a seven-tine cultivator invented by him. They were worked with a fourteen horse-power engine of Messrs. Kitson & Hewitson, of Leeds, and which is constructed so that it may be adapted to the purpose of thrashing, and to most farming operations. The engine was a powerful one; its arrangement of the wire ropes was preferable, in our opinion, to either of the others.

As to the practicability of introducing these machines into our country, I have great doubts. From the best estimates that I can make, the expense of plowing will be more than by our ordinary methods. The constant wear of the machinery and wire ropes must be very expensive; the difficulty when the engine or ropes give way, as they undoubtedly will, must render it very doubtful, to say the least, as to their being introduced into practical use. The quantity of fuel and water to keep the engines in operation is very large, and of course very expensive. It must, however, be had, and will add largely to the difficulties in the way of its introduction in our country at present. I had hoped to have seen a traction engine with plows and other arrangements to do the work, but there was none present; and from information obtained from a leading implement maker, it appears not to have given satisfactory evidence of its being successful. It is certainly very desirable to secure the application of steam successfully to aid in the cultivation of the farm; and in the onward march of improvement in machinery, I trust we shall yet be favored with the right machinery to accomplish the work—the machine so simple in its arrangements as to be managed by ordinary laborers, thus avoiding the expense of engineers, who now have to be employed.

After the plowing was disposed of, the trial of mowers was had. Reapers could not be tried, as the grain was not ripe, and would not be under two weeks.

There were from ten to twelve mowers, I think, on the field, but all of them were not tried; they were all, I believe, of American origin, and several were made in America—Wood's, Osborne & Kirby's, Tremain's, the Buckeye, I believe were all made there. The others were made here, some with modifications of the original machine, some with improvements valuable, and others quite doubtful. There were no arrangements to test the draft of the machines, or the amount of land which could be cut in a given time in the ordinary work in the field. The grass was light, though quite thick at the bottom, and required the knives to be properly arranged so as to prevent clogging—a neglect to do this in some cases very much marred the work of some of the new machines, especially one or two from our country. The machines were put in operation, each one managing as he thought best, the judges following the machine around the land two or three times, ascertaining how it did its work, and this, so far as I could judge, was all the means used to ascertain the qualities of the machine for actual farm work. This was surely not such a test as would settle any question as to the value of a machine. It was apparent in the trial, that where a good pair of trained horses, used to the work, with a driver equally well trained, the work was altogether better performed than where a strange span of horses and driver were used. Several of the machines performed their work, I thought, very well indeed, and some of them with very light draft, and others the draft was apparently quite heavy. Wood's small mower, and Burgess & Key's mower (the Allen mower, I believe, improved by them,) performed the work, I think, most satisfactorily, though some of the others did very well. The judges had not made their report when I left the show grounds this afternoon, and I cannot give the award, but presume that the prize, only

one being offered, will be given to Wood's small mower, to which it was awarded by the Royal Society at Leeds last year. It is a very good machine, and works well in grass adapted to its use.

The show, which opened this morning, is an excellent one. The cattle (Short-Horns) were, as a whole, first-rate, and far better as a whole than at Battersea—that is, there were fewer inferior animals, and unworthy a place in a show ground, than at the Royal show. In fact, there was scarcely an animal but what would be esteemed *good* exhibited, and in some of the classes, especially the cows and heifers, they were extraordinary. Mr. Booth's cow, "Queen of the Vale," the prize cow at Battersea, won the 1st prize here, against five competitors, which were not easy to beat. The 2d prize to Mr. Eastwood of Swinshaw House, Burnley, bred by Mr. Wetherell. The other exhibitors were Lord Feversham, Mr. Douglass, Col. Townley, and Lady Pigot. They were all excessively fleshy, altogether too much so for breeders. But fat reigns here in cattle, sheep and swine, to a degree far above anything I have before seen. Yorkshire pigs were in the ascendant, and they are really worthy of their fame. The Leicester sheep appeared first-rate. The horses were as a whole very good—in the hunter and roadster classes far ahead of Battersea. I have not time to write further as to the show, but will endeavor to give you a report as to the residue of the show. A horticultural exhibition adjoining the show grounds was opened to-day, showing that Yorkshire is equally celebrated among the roses as among the Short-Horns. B. P. J.

Trial of M'Cormick's New Reaping Machine.

London, *August* 15, 1862.

My Dear Sir,—Yesterday I attended a trial of Mr. M'Cormick's new self raker, on the farm of Mr. Dixon, near Boxmoor, about 20 miles from the city. Hon. E. Cornell, R. M. Hoe, H. L. Emery, Mr. Sickles, of New York, and Mr. Taylor, of Ohio, were present. There were a number of English gentlemen present; and although it rained most of the time, the reaper was tried and gave good satisfaction, as you will see by the inclosed from the *Times* of this morning. It will add largely to the sales of Burgess & Key, who have secured the attachments for delivery.

I expect to leave for home with Mr. Cornell and others, in the *Arabia*, for Boston, on the 6th of September. Yours truly,

B. P. JOHNSON.

L. H. Tucker, Esq.

[We are obliged to condense somewhat the report from the London *Times* which accompanied this letter.—Eds.]

In 1851 M'Cormick's American reaping machine at the exhibition created a greater sensation in its way than either Powers' statute or Hobb's locks. Its fame at once, of course, raised up for it a host of antagonists and imitators. * * Since 1851 M'Cormick's patent for these machines has expired in America, and, of course, the attempt to renew it was violently opposed by all who had, or fancied they had, a better reaper themselves. * * Hence, Mr. M'Cormick was driven to invent another and a better machine;

and it was this which was tried yesterday, and the performance of which we commend to the notice of our country readers. The old machine, as we may term it now, was one which cut the corn, and as it dropped back upon the platform behind the cutters, turned it off in "swathe"—*i. e.*, left it in a continuous roll alongside the track of the machine. In very moist countries this swathe delivery is rather an evil, and during the wet seasons the machine has been often left unused altogether. In addition to this drawback a great amount of manual labor is, of course, necessitated to collect the swathe into sheaves, and this too must in some cases be done before the return of the machine over the same track. The object, therefore, has always been to invent a machine which will deliver on the ground the cut corn in sheaves ready for binding, and such a machine Mr. M'Cormick has now invented. Visitors to the exhibition will see a similar one in the rather empty court of the United States.

The new machine is founded entirely upon M'Cormick's old machine as made by Burgess and Key, the new patent consisting simply in the introduction of an automaton rake, which, at regular intervals, by one rapid sweep, draws the corn on the platform together, and, with a quick turn, throws it aside in a loose sheaf out of the way of the machine. This machine has been tried once before in England among some of the heavy Essex crops, when its performances exceeded the most sanguine expectations. Yesterday it was publicly tried again, in the presence of a number of gentlemen farmers, on Mr. Dixon's farm, about three miles beyond Hemel Hempstead. This trial was made under the most unfavorable circumstances; in fact, under circumstances which the farmers present contended should have prevented the machine being tried at all. The night and morning had been very wet, and the rain was still falling sharply when the machine, drawn by two horses, and wielding its fans and rake in the most aggressive manner, was brought to a field of 21 acres, covered with a very heavy crop of red lammas wheat, completely saturated and bent down by the rain. Along the edge of this field, where the ground was very rough, and the corn straggling and beaten down, the machine was turned. Much misgiving was expressed before starting as to the power of the rake to act on such ground against wind and rain, and to remove the soddened crop from the platform into regular sheaves. A very few moments, however, sufficed to put these fears at rest. The reaper went to its work at the rate of about three miles an hour, making a clear cut broad track of five feet six inches wide, and turning out neat and remarkably large loose sheaves at intervals of about fifteen feet apart. The movements of the reaper were exact and perfectly noiseless, and it was easily turned in any direction. An ordinary agricultural laborer at first drove it. Afterwards Mr. Dixon took the place of driver; but the results were the same in both cases. The bunches were well laid, the cut was clean and close to the earth, and the spacing between the sheaves as clear and accurate as if every foot had been measured. At one part the corn was tangled and badly flattened,—badly enough to have offered difficulties to the ordinary reaper; but the machine went through it with the same ease and regularity as through all the rest. The horses were then turned direct into and across the thickest part of the crop from corner to corner of the

field, and though, as a matter of course, the passage of the animals drawing the machine trampled down a large portion of the stalks before its track, the reaper still worked as cleanly and efficiently as ever. First came one of the fans, pushing its *quantum*, when cut, on to the platform; then a second, third, and fourth, when the rake swept round in a semi-curve and turned the whole mass out in a thick sheaf on to the ground. The horses appeared to draw it easily—more easily, in fact, than the old machine; while, from the strength and simplicity of the improved mechanism, it was evident that, even in the most inexperienced hands, nothing but willful damage could derange its slight but strong machinery. Yesterday the trial was brought to a premature close by perfect floods of rain, which, though in no way interfering with the perfect action of the reaper, had, at least, an effect on the gentlemen who assembled to witness its performances. Work was therefore discontinued; but it will be resumed to-day on Mr. Dixon's farm, where sufficient corn remains to be reaped to enable all those interested in the working of the machine to witness it in operation for the next 14 or 18 days to come. It is estimated that the new reaper can reap and stack in sheaves from 16 to 18 acres of wheat per day, at a cost, including wear and tear of plant, food of horses, &c., of 1s. 6d. per acre. Manual labor costs from 7s. 6d. to 10s. per acre; and a good hand reaper only averages from half to a little over half an acre a day. The new machine effects a saving of at least one-third of the manual labor that was still necessary with the old reaper; and the price at which Messrs. Burgess and Key will be able to sell it will be lower than that which has hitherto been given. The price will probably be £34 for the new machine, as against £36 and £38 for the old. Farmers and others interested in agriculture should go and see it in work for themselves. No amount of description can ever recommend it as strongly as it does itself when quietly at its work.

The Yorkshire Agricultural Show—Visit at Several Herds.

York, *August* 21, 1862.

L. Tucker & Son—In my last letter to you I think I closed with a description of a portion of the cattle at the fair (aged cows.) In the afternoon the judges appeared again, and the 3 year old heifers were first brought into the ring—and such gems I had not before seen—and the time spent by the judges in arriving at the decision showed how perfect were the animals shown. And an equal difficulty arose in the 2 year olds. One year old heifers—the number in this class were larger, and general commendations were given to most of them in addition to the prizes awarded. The calves also were first rate, and though not numerous, they gave evidence that the material was on hand for future shows. The milch cows and fat stock, of great excellence, followed and closed the labor of the day. The next morning the horses were passed upon, the weather being very unfavorable, the rain pouring down during the entire fore part of the day. I had an opportunity the previous day of examining the horses carefully, and they sustained the character of Yorkshire for fine horses in all the main departments. The working horses, hunters and riding horses were most excellent, far excelling the Royal show at Battersea. The thorough-

breds were perhaps not equal to the Royal, but, taken together, Yorkshire far excelled. The implement and machinery department was far larger than at any former show, and was a very attractive one, many new and improved implements being on exhibition. The residue of the exhibition did not present anything peculiarly attractive. The dinner the evening previous was well attended, and the usual loyal and local toasts were given and speeches made, which had nothing special to recommend them, except in one or two instances.

Mr. Cornell and myself came down on the 19th of August to Wetherby, to examine Capt. Gunter's fine herd of short-horns. We called at his farm adjoining Wetherly on the morning of the 20th, and ascertained that Capt. Gunter and his herdsman Mr. Knowles were absent, the captain being at York attending the races. The attendant in charge of the herd, Mr. Hill, was present, and gave us an opportunity of examining this fine herd of Duchess short-horns, of which the herd is mainly composed, and the best of that class of short-horns in this country. Capt. Gunter has 16 female Duchesses—Duchess 78, one of the twins, having dropped the 16th, a few days before we arrived. The animals were all of them in a fine healthy condition, and among the younger ones are several which will doubtless be heard of hereafter in the field open to all. The captain has been very successful as a winner at the Royal and other shows, and we imagine he will not be less so hereafter. One of the Duchesses, the 77th, has now twenty-eight first prizes and five cups, three of the value of 100 guineas each, and the others 25 guineas each. She has never been beaten. We regretted very much not to have seen Capt. Gunter. We left for York in hopes to meet him, but in the crowd present at the races, we were unsuccessful. We had an opportunity of witnessing some half dozen or more races, which were very exciting, but we were doubtful whether as much good was done to the country by these race week exhibitions as was done at some of the great agricultural exhibitions of a few weeks previous.

We went from York to Ripon to see Mr. A. L. Maynard's herd of short-horns at "Marton Le Moor," about four miles from Ripon. We went up this morning and were favored with an examination of this superb herd of short-horns, numbering about 100 head—the animals all in healthy condition, without a single one *being overfed*—all having their living upon the pastures, except the bulls, and this is and ever has been the practice of Mr. Maynard. We were greatly gratified with our examination, and were glad to meet a gentleman who remembered the Collins, having seen them often, and whose father was an associate of these men; and some of the stock which we saw *descended directly from Favorite*, and other celebrated bulls of that early day, before herd-books were known. Mr. Maynard, though somewhat infirm, showed us a portion of his herd, and we were truly thankful for his kindness and for the information he gave us. His stock were remarkable for their fine touch—not a *hard-hided* or flabby animal among them all; Mr. Maynard will not have such upon his farm. He has 600 acres at this farm here. One of his assistants went with us and showed us the stock in the different fields which were not shown by Mr. Maynard. It is not improbable but that some of these animals may find a home in New York; if they should, we shall be much disappointed if

they do not compare well with our best stock. Mr. Maynard's fattening bullocks are kept at another farm about 20 miles distant.

We were at Ripon for a time, a fine old town in the west riding of Yorkshire, dating from 663! and has its cathedral, which, though not equal to York minster—which excels anything we have seen in the way of cathedrals—is a very attractive building, with a history anterior to York. In the market place of this town is the market cross, an obelisk 90 feet high, erected at the expense of William Aislabie, Esq., 1781, who was a member of Parliament from this borough for 60 years. The time has passed when any man, however faithful, can enjoy such an office for even one-third of the time. The country about Ripon is a fine farming country; the business of the town is not large. Many of the edifices date from a very early period, and if any person wishes to live in the midst of recollections of the oldest times, unannoyed by the noise and bustle of our day, I can assure him "Ripon" is the place for him. B. P. J.

Agricultural Impressions in England—The Different Crops—Hurdle Fences—System of Sheep Feeding, &c., &c.

LETTER FROM MR. CORNELL.

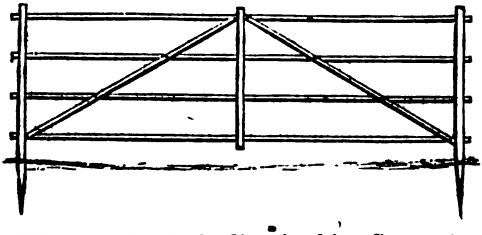
London, *August* 25, 1862.

Friend Tucker—In response to your wish, communicated through our mutual friend Col. J., I turn out this morning at 5 A. M. to write you a short letter, but I fear I shall fail to make it interesting to either yourself or the readers of the "Country Gentleman," as my mind is constantly diverted from the subjects I must write about, by the gloomy aspect that English type gives to American news.

A visit to Rothamsted, in July, furnished instructive and interesting matter for a letter, and I intended ere this to have put it in that form, but the moments passed occupied by other objects, and now the memorandums are packed for their homeward voyage, where they must rest for the present.

I see much here that interests me, and it appears to me that we may learn much that will be useful to us as American farmers. England, in some respects, is better tilled than America; in others not so well. Plowing, the foundation of good agriculture, is done better in New York than here, and the American plow is a better implement and better adapted to its uses than the English plow. The harrowing, cultivating, pulverizing, crushing, rolling and drilling is done better here than with us, but at an expense of horse flesh and labor that our farmers would regard as ruinous. Harvesting here is an antiquated process, descended from the Romans, the Normans, or some other ancient race of people, entirely out of place in the nineteenth century. With labor at half the price we pay at home, I am confident that it costs three times as much to put a field of wheat in the shock as it does in New York. Securing the hay crop is equally tedious. I have seen hay fields here in which the new grass had grown six inches after the field was mowed before the hay reached the stack. More pains is taken here than with us to have the wheat pure and varieties unmixed. In hundreds of fields that I have noticed with care, I have failed to find a

head of wheat other than the variety sown. This is done by carefully picking over the sheaves that are thrashed for seed, and removing other varieties, if any are found. I have not seen a single spear of rye growing in a field of wheat since I have been here, and rye is grown here in nearly the same proportion, I judge, that it is in New York. Barley is also cultivated with like care, and the different varieties are kept separate; the two-rowed mostly cultivated. Oats are less cared for, and the varieties are mixed quite as much as with us. The vetch, or tare, is cultivated much for early green food, and is eaten freely by the horses, cattle and sheep; it is also grown to be fed off by hurdled sheep, with a view of fertilizing the soil, a practice I think that we can adopt with profit. Rape is also grown for a like purpose, and is said to fatten sheep very fast, and the sheep certainly fatten the land very fast. Our climate is not adapted to feeding off a turnip crop in the fall and winter, as it is done here, but I see nothing to hinder the feeding off a crop of vetch or rape in July and August, as a foundation for a wheat crop. To carry this in practice we want a convenient and cheap hurdle fence. Here such fence is made generally of split hoop-poles for bars, with the ends framed into saplin posts, and a like post nailed across the center of the bars, with two braces of split hoop-pole nailed on to the bars, the end posts long enough to drive in the ground to support the fence, thus:



This makes a light fence, easily moved, and if properly housed when not in use, will last for years for hurdling sheep.

The practice in feeding is this: Supposing we have a flock of 100 sheep, half of them dry ewes and wethers, that we wish to turn off fat to the butcher, the others to be wintered, and the vetches are large enough to be fed off, we get out the hurdle fence and fence off say the eighth of an acre, and place the 50 sheep therein that are to be fattened, where they remain a few days, until they have fed off all they seem inclined to take freely, when a new lot is fenced off for them, and the store-sheep take their place; and thus the one follows the other through the field, leaving a naked fallow behind the store-sheep, finely fertilized, and in the best condition to be turned over to receive a crop of wheat. In feeding the rape, I am told that it springs up after being fed off, and furnishes successive crops of feed, so that it may be fed off two or three times during the season and then furnish a crop of seed the next season; but with us, I presume the frost of winter would kill the roots, so that we should not get the crop of seed. The top of the rape resembles the top of the Swede turnip, the root that of a radish; it will succeed, I think, on any good corn land; and the seed should be drilled in as turnips are, say in rows two feet apart. We may have plants at home that will do equally well to hurdle sheep upon. I refer to this subject for the purpose of directing the attention of our farmers to this mode of fertilizing our farms, while we are supplying our markets with the best of meat.

The turnip and mangold are very extensively cultivated here, and with-

out them England could not feed half her stock, or furnish her people with beef and mutton Their moist and cold climate is better suited to the root crop than ours, and justifies its more extensive culture; but I think we could profitably increase the culture of the Swede and mangold, and depend on them to a greater extent than we do for feeding our stock. The cooling nature of the mangold is well suited to counteract the heating tendencies of our Indian corn, and the two would go well together in fattening bullocks.

The live fences of England I think less of than I did before I saw them. The hedge generally occupies as much, or more, land as our crooked rail fence, and is quite as expensive. A stone wall is the best and cheapest farm fence, when the material is at hand to build it. England and America both have more fence than is profitable or desirable, in my opinion; the Continent perhaps has less. In traveling from Calais to Paris, thence to and through Switzerland, Germany, Prussia, and Belgium, we saw no fencing of farms, no hedge rows or waste land between crops. Cattle are easier fenced in than out, and the easiest method is pursued.

In England it is being discovered that they have more hedge rows than they can afford, and one estate that I have heard of has recently reclaimed and added 45 acres to its tillable lands, by uprooting old hedges and consolidating fields. It is high time for a fence reformation at home; but we should not be so radical as to destroy all our fences at once. E. C.

Borers in the Honey Locust.

LETTER FROM ASA FITCH, M. D., ENTOMOLOGIST OF THE SOCIETY.

Hon. B. P. Johnson: The letters which you forward me, with an accompanying box of insects, from Robert Howell, Esq., of Nichols, Tioga county, N.Y., dated January 27th, brings to our knowledge a fact not recorded before, that I am aware, namely, that the locust tree borer, *Clytus Robiniæ*, of Forster, (the same insect which was subsequently named *C. pictus* by Drury, and still later *C. flexuosus* by Fabricius,) which so greatly injures the locust trees all over our country, sometimes establishes itself also in the honey locust, *Gleditschia tricanthus*, in which it is thereupon apt to continue until it ruins the tree.

Mr. Howell says he set out two trees of the honey locust in his door-yard about twelve years ago. A few years after they were found to be badly infested by borers, which began to throw out their chips or worm dust from the trees each year about the tenth of June, the worms being then about three-fourths of an inch long, and of a dirty white color, with red heads. For a few years past the trees had become so much infested and eaten that numbers of their limbs died; and about the first of August last he cut them down. The larger tree was about six inches in diameter, and its body was completely cut to pieces by holes bored everywhere through it, and about a hundred in their pupa state—large, plump fellows, an inch long—were found in it. Some few weeks after, on splitting up the wood for fuel, other specimens were found, changed to their perfect state, but dead, and more or less decayed. One was obtained perfect, which he sends us. Some of its yellow bands are partly and others are

wholly obliterated, as they are liable to be in rubbed specimens of this beetle.

I may here remark, that my experience has been quite different from that of Mr. Howell. Two trees of the honey locust, which I planted in my yard twenty years ago, have been the most clean and free from insect vermin of any of the deciduous trees in my grounds. Though the borer is often present in the common locusts growing around them, it has never entered these trees.

I may add that I have from T. B. Ashton, of White Creek, a specimen of the locust tree borer, which he tells me was bred in the black walnut, *Juglans nigra*, in Pennsylvania, where it is not uncommon for the larvæ to occur in that tree.

The beautiful miller in the box is the *Clenucha Latreilliana* of Kirby—a very rare species—which I have met with only in a single instance, on the last day of June, the day before the date on which Mr. H. found this. No particulars of its habits are yet known. The other specimens in the box are common species, of which I have nothing to say, which is not already communicated to the public. Yours truly,

ASA FITCH.

Berkshire County, Mass., W. Bacon.

Hon. B. P. Johnson:

My Dear Sir: The present winter, though the contrast is great with that of several years past, we do not claim is without a parallel. We have up to this time had but little snow; a few inches fell in November, and gave an apology for sleighing for nearly a week. This went off and left the ground without frost. Early in December we had another fall, attended by a high wind, which rendered it unavailable, there being drifts and bare ground in about equal proportions. Then came on a warm turn, and the snow and frost alike disappeared. January has been very mild up to this date, and without sleighing. On the night of the 15th, and forenoon of 16th, we had a heavy fall of rain for any season, especially for winter. The streams were raised very high; the swamps appeared like lakes, and the highways were badly washed. The greatest degree of cold, so far, was 4° below 0, early in December. In January, up to date, the coldest morning was the 18th, mercury at 7°. With so mild and varying a temperature we have, of course, had much freezing and thawing, muddy and very rough traveling.

Many of our farmers are lamenting this absence of snow and the power of frost on the land, which events may to some extent be injurious; yet this change from former winters will work some valuable ends—at least the effect will be to destroy many of the insects which, for a few years past, have been increasing in so formidable a ratio. I well recollect that early in March, 1861, during a few days of mild weather, grasshoppers began to make their appearance. A cold turn followed, and I do not recollect a year within my memory when so few grasshoppers were seen in summer. The warm weather alluded to probably brought them forward, so that the frost gave the finishing blow. Now we have days so warm in

this January that I have seen musquitoes and felt their bite—not many, however. But how many there were so nearly approaching life, that the frost will give them effectual death, we cannot calculate. And why may not the result be the same with many of our annoying enemies? Surely we believe the season is ordered in wisdom, and that most noble effects will be the result.

Crops are doing well. Notwithstanding the many moderate days to warm the earth, health seems to prevail in all our farming counties. Hay is very plenty, worth in market only $9 per ton. Oats weigh light, rarely coming up to the standard weight, 32 pounds per bushel, while in some instances they fall as low as 18 pounds per bushel. They are now selling at two cents per pound. So far as I am informed, the black oat gives the best weight. Corn is worth $1 per bushel. Buckwheat has sold high, and, in barter, the millers have given one hundred pounds of Indian meal for one hundred pounds of buckwheat.

Notwithstanding the unusually high prices of sheep, many of our farmers have purchased largely in view of the prospective high prices of wool—an experiment that may work well for them for awhile; but when we take into account the diminution of other stock, and the increase of sheep the last year, and probable additional increase that will follow, it must, from the nature of the case, follow that reaction and consequent depression will in the end ensue, and the balance will turn in favor of other stock.

Yours very truly WILLIAM BACON.

RICHMOND, *Jan.* 23, 1863.

TRANSACTIONS, 1861.

COUNTY SURVEYS, REPORTS ON INSECTS.

Hon. B. P. JOHNSON:

MY DEAR SIR: Your favor of the volume of Transactions for 1861 was duly received, and should have been earlier acknowledged; but circumstances beyond my control have caused me to be negligent in this, as in many other duties, it would have been a pleasure to perform.

I have given the volume a very careful review, and find it marked with all the improvements that the progress of the art it is designed to advance admit of, in the present state of agricultural progress.

In addition to the ordinary topics of the volume, it possesses two valuable features, which I believe are peculiar to your Transactions, either of which possess a value equal to the cost of the work, and should commend it to the patronage of farmers everywhere; I allude to your County Surveys and to the Reports on Insects.

The former places the position and agricultural facilities of each county so familiarly before the reader, that he may become almost as well acquainted with its capacity as though he had traveled over it and witnessed the facts it so truthfully delineates. So the man who reads these surveys may compare the counties on which they treat with his own, and make all the deductions and draw all the inferences necessary to convey ideas of why they differ in their natural powers of production—a very important matter in agriculture.

The knowledge of insects is one that is every year becoming more and more important to all who cultivate the soil. Indeed it is becoming necessary just in proportion as he would succeed in his profession. They are increasing yearly in number, if not in variety, and their power of destruction is only broken by destroying them. To do this, we must not only become acquainted with their names but their habits, and then, perchance, we may gain mastery over them. In your Transactions you are, from year to year, throwing this knowledge in the path of farmers, and we sincerely hope they appreciate these kind labors in their behalf.

Please to accept my thanks for the favor of this volume, and also for the innumerable favors received in past years.

I have now copies of your Transactions from 1847, excepting for 1860, and I consider them a very important part of my library, which, for a farmer's library, is pretty extensive, reaching 1,000 volumes.

Yours truly, WILLIAM BACON.

January 23, 1868.

TRANSACTIONS OF THE NEW YORK STATE AGRICULTURAL SOCIETY; WITH AN ABSTRACT OF THE PROCEEDINGS OF THE COUNTY AGRICULTURAL SOCIETIES. VOL. XXI., 1861. ALBANY: C. VAN BENTHUYSEN.

If the number of agricultural societies in a country is any indication of the state of its agriculture, New York State cannot be behindhand in the march of improvement. The volume before us contains not only the report of the General State Society, but also sixty other reports of the local county societies, many of which are deeply interesting to the English reader, not only for the information they afford of the present condition of agriculture, but also as throwing light upon that of rural life in America—at least that portion of the United States to which it specially refers. Many of the reports display great intelligence, proving that science is making its way *there* upon the farm, as well as in "Merrie Englande;" and unless the present gigantic war interferes to check its progress, the agriculture of New York State is certainly in a condition of progressive prosperity. Not the least interesting portions of the volume are the agricultural statistics of the State of New York, furnished from the census of 1860 of the United States. It includes returns of the produce of every county, and concludes with a summary, showing the increase or decrease of the various products since 1850; and although there has been a considerable falling off in many articles—wheat, for instance, nearly 4½ million bushels; cheese, upwards of 1 million pounds; sheep, 835,286; cattle, 137,376, etc, in other kinds of produce the increase has been very great; and perhaps the best proof of the progress of agriculture is found in the fact that the increased cash value of the farms of the State is estimated at $248,796,951, or £49,759,390 sterling; and that of farm implements $7,081,769, or £1,416,354 sterling. We cannot enter further into the matters contained in 870 pages of this volume, but we can affirm that it throws more light upon the present condition of agriculture in the old States of

the Union than any work extant, and will well repay for its perusal.—*Mark Lane Express, London, February 9th.*

We had the pleasure of meeting the editor of the *Mark Lane Express* when in England, and regretted very much that our engagements prevented us from seeing him more frequently. His appreciation of our Transactions, which we presented him, shows that the progress of our country is being understood by intelligent gentlemen who are conversant with our agricultural publications, which give a fair account of the true condition of our country. We thank the editor for his appreciation of the intelligence of our farmers, whose reports he refers to as evidence that "the agriculture of New York State is certainly in a condition of progressive prosperity."

SPEECH OF HON. JUSTIN S. MORRILL, OF VERMONT, IN THE HOUSE OF REPRESENTATIVES, JUNE 6, 1862.

The House being in the Committee of the Whole on the state of the Union, and having under consideration the bill donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts—

Mr. Morrill, of Vermont, said:

Mr. Chairman: I shall avail myself of the parliamentary privilege to-day, of general debate, to make a speech without the pepper and spice of party or sectional politics, and yet I hope one not without some interest to the House. I shall discuss a measure which has heretofore received a generous support on the part of Democratic members, almost the undivided support of the South American members, (formerly so-called,) and, with about two exceptions, the undivided support of the members on this side of the House; I mean the land college bill, for which I hope to obtain the favor of a large proportion of the present House.

Mr. Chairman, among all the measures before Congress since I have been a member, there have been few, save those designed to maintain the credit of these United States, which my judgment and heart have more approved than this measure providing for the education of the industrial classes of young men of our country. Just in itself, benevolent in its scope, demanded by the wisest economy, it will add new securities to the perpetuity of republican institutions. Wronging nobody, it will prove a blessing to the whole people, now and for ages to come.

The bill, or one like it, has once passed Congress by very large majorities, but unfortunately, among other sins which President Buchanan now has leisure to repent of, is his veto upon a bill of this character. Under more favorable auspices it is now again brought forward. If it passes, as I cannot doubt it will pass, Mr. Slidell, were it convenient for him to be here, could hardly command a veto from the present patriotic occupant of the White House, as he was charged with having done on a former occasion. With this Congress my humble services here will terminate, and the only favor I have to ask of the House is to vote upon this measure squarely on its merits. If its character challenges approval, if the times more than ever persuade to its adoption, then give such a vote as will wake into life the instrumentalities whereby a solid, useful and practical education can be had on terms within the reach of thousands willing and expecting to work their way through the world by the sweat of the brow.

It is true that some measures which we have been considering, of more or less merit, I have thought it inopportune to press at this particular juncture of affairs; but I do not include this among them. Instead of being postoned, it is a measure that should have been initiated at least a

quarter of a century ago, and if it had been, our taxable resources would now have been far greater than they are, and the absence of all military schooling would at the outset of the present rebellion, have been less conspicuous in the loyal States. Agriculture might long ere this have felt its influence; the statistics of the country might have been more abundant and valuable; the young men might have had more of fitness for their sphere of duties, whether on the farm, in the workshop, or in the battle-field.

Something of military instruction has been incorporated in the bill, in consequence of the new conviction of its necessity, forced upon the attention of the loyal States by the history of the past year. A total unpreparedness presents too many temptations even to a foe otherwise weak. The national school at West Point may suffice for the regular army in ordinary years of peace, but it is wholly inadequate when a large army is to be suddenly put into service. If we ever expect to reduce the army to its old dimensions, and again rely upon the volunteer system for defence, each State must have the means within itself to organize and officer its own forces. With such a system as that here offered—nurseries in every State—an efficient force would at all times be ready to support the cause of the nation and secure that wholesome respect which belongs to a people whose power is always equal to its pretensions.

This bill proposes to establish at least one college in every State, upon a sure and perpetual foundation, accessible to all, but especially to the sons of toil, where all the needful science for the practical avocations of life shall be taught, where neither the higher graces of classical studies nor that military drill our country now so greatly appreciates will be entirely ignored, and where agriculture, the foundation of all present and future prosperity, may look for troops of earnest friends, studying its familiar and recondite economies, and at last elevating it to that high level where it may fearlessly invoke comparison with the most advanced standards of the world. The bill fixes the leading objects, but properly, as I think, leaves to the States considerable latitude in carrying out practical details. Some of the States already have colleges started on the principles here embodied—as Pennsylvania, New York, Michigan, Maryland, Ohio and Iowa—but these linger with a very incomplete staff of professors, as might be expected from the scantiness of their funds. The aid tendered here will enable these States to fully equip these institutions or to found others where it may be thought wise to give military science something of greater prominence. Some States, perhaps, may have more literary colleges than are or can be liberally sustained. Part of these may be easily transformed so as to come within the terms here proposed. Every State will be the judge of its own requirements, and I have no doubt each will feel sufficient interest in the subject to make a judicious disposition of the grant.

Against all speculation or squandering, this bill is most stringently guarded. The entire fund is to be held good, and wholly devoted to the object, as the States are to pay all incidental expenses, even the first cost of the buildings and their subsequent repairs. But it cannot be doubted that in every State this charge will be mainly a nominal one, as many

towns will be likely to strive to secure the location of these institutions within their limits, and an active competition will arise from the tender of lands and buildings, in order to obtain an end so desirable.

If these colleges should be established, it is to be hoped the donation of lands, with some little outside aid, will be sufficient at no remote period to offer instruction free of any charge for tuition, and that through connection with farms which may be attached, indigent young men, by voluntary labor of a few hours each day, may, where desirable, give an equivalent, wholly or in part, for their board. Certainly the opportunity of obtaining a sound education adapted to the wants of the individual will be offered at reduced rates, a love of useful labor will be promoted, and thus health and usefulness cannot but be advanced among those who otherwise might waste a life in uncultured ignorance or cultivated imbecility.

Not one in fifty of those young men who apply to us to be nominated as candidates for the Military or Naval Schools, can be gratified. All these young men feel conscious of their ability to do something honorable for themselves and their country, and their ambition takes the direction of these schools, mainly because they know not how elsewhere to obtain a fitting education. The numbers of this class will now be greatly augmented. The ability of parents to educate their children will be curtailed, while the desire to obtain an education, especially a military one, will have been increased. These young men, if this bill should pass, will find a field open to them large enough to satisfy all reasonable ambition.

There is no appeal that comes so resistlessly to our sympathy—and there are few men here, I dare say, who have not felt it—as that of a bright-eyed boy, without means, but strong in virtues and noble aspirations, seeking the temporary aid that will enable him to achieve a liberal education. Let the corner-stones of these land colleges be laid, and this army of lads, who are so soon to take charge of the institutions of our country, will, with all the enthusiasm of faith and hope, "thank God and take courage!"

The question, "What shall we do with the public lands?" has long been one of the most interesting political problems to be solved. In ordinary times our taxation has been so light that the revenue obtained from this source might have been reimbursed from other sources without much complaint; but now we have not only to curtail expenses, but to enlarge the circle of every revenue bill. From the seeming vastness of our public lands, magnified by all the wastes, mountains, waters and deserts, it has been thought impossible to overestimate their extent or value; and on the theory that they were inexhaustible, they have always, when sold, been held at an inconsiderable price—scarcely more than the fees for transfer and record of title in older countries—and, when given away, the mile-squares have been bestowed with a lavishness only equaled in the days of feudalism. The legislator, from his dizzy height, has looked over all the broad area, and like one of old has been ready to say to all with unappropriated votes, "all this will I give thee, if thou wilt fall down and worship me!" Grants for railroads and military bounties have been made with such loose abundance as to destroy the gifts and more than satisfy all demands, whether of the hardy pioneer or the velvet-footed speculator.

Our bounty has proven a deluge rather than a refreshing shower. All markets have been glutted, until these Government largesses, sweated and consumed by their own reeking fatness, have shrunk to less than half of their original value, and in part now remain, having conferred benefits only by halves, to clog the operations of Government in its hour of largest beneficence and largest need.

The Government price for land, except to actual settlers for five years, is now $1.25 per acre, and if it were five dollars per acre, it would be no dearer than $2.50 was twenty years ago to the settlers of Indiana and Illinois, and cheaper than any other land of equal value now to be had under the most enlightened and liberal Government of the world. Even in Australasia, where they sell land at auction for all it will bring, the upset price in the poorest colonies has been not less than one pound sterling or about five dollars, and then what more they can get, while the best lands and those within three miles of any town are held much higher. To the 500,000 farmers in France, who own upon an average but seven acres each, $1.25 per acre must appear a bagatelle, and to the Irish farmers, who in some rare localities, pay £10 to £30 (or $50 to $150) rent per acre, it must look like a *bull* on the part of Brother Jonathan.

Those who have given this subject that attention it deserves, know settlement has already approached the limits of most of the profitable farming lands within our domain. Some of the lands are fertile, but destitute of wood or of water. The red man still wanders on the verge, and where he has disappeared, the prairie wolf remains at least to frighten sheep. With some good, there is much poor land in our western Territories. An acre may be worth the Government price, provided there is a dozen prairie chickens upon it! In the new States there is much land yet to be had of great value at very low prices, but comparatively little of this remains in the hands of the Government. In our Territories the fertile lands are not found to be universal, as they were nearly so in Illinois and Iowa, but they lie in parcels—here a little and there a little—embroidering the margins of streams, and standing forth in greater beauty from the rule of contrast—oases in the deserts.

There were, September 30, 1861, of surveyed public lands 134,218,830 acres, the unsurveyed being many times greater. Of these lands, it is proposed to donate to the States for these colleges, if all should accept the conditions, about 9,000,0000 acres, or 6,000,000, if only the loyal States should be able to avail themselves of the grant. It is an inconsiderable grant in proportion to our means, and not a large one in proportion to the object in view. We have now abandoned the public lands as capital, with the design of deriving a large revenue from those who may settle upon them and make them fruitful. And here these land colleges come into aid in the plan of improving, not only the new lands, but also the old, and thereby extending the basis of taxation and revenue. A tract of land to a man who knows how to make it a real homestead, with all its train of joys, is a blessing; but to all others it is at best a bauble, and often a curse. To give all men an opportunity by their own labor to obtain a substantial support, is a problem most Governments endeavor to solve. We have a higher and possibly more difficult task, which is to combine the largest

freedom with the largest rewards of labor—free government and personal independence—and this can only be done by the largest knowledge. Success in working out this problem secures the immortality of our Republic. The man who earns but fifty cents a day cannot be taxed one-fourth part of it, or twelve and a half cents, without starving his children; but let him earn two dollars a day, and he will pay double the amount, or twenty-five cents, and not only survive it, but ask the tax gatherer to stop and dine!

The policy of the Government towards the Territories and the new States has been liberal, as it deserves to be; but I think few who have not read the report of the Secretary of the Interior, are aware of the extent of that liberality. Within the last four years there have been granted to States and Territories, and reserved from sale, 49,754,606 acres. Each new State now has university lands, salt-spring lands, public building lands, and 500,000 acres each, under the act of 1841. One-eighteenth part of all the lands are also at once given to the new States for schools. We have given them, up to 1861, 9,998,497 acres for railroads. Then we have surrendered all the swamp lands, amounting within the past four years to 3,910,310 acres; and the entire claims of the several States under this head, amount to 57,895,577 acres. Added to all this, we give the land States five per cent. on all sales of land within their borders, after they are admitted as States. This is not treating these States as step-children. The four States of California, Minnesota, Oregon and Kansas, are entitled to 15,632,635 acres for school purposes alone. Beyond all we have passed the homestead law.

All the bounty land warrants and scrip issued under different acts of Congress, embrace an aggregate of 71,717,172 acres. Of this amount, all the warrants have been located except 7,454,720 acres. If the present bill should pass, it would only about double the quantity now afloat, and scarcely exceed the amount allotted to some single States. The total amount of unsold and unappropriated lands, is 1,046,290,093 acres; and, after deducting the proposed donation to these colleges, we could quadruple the amount, and still retain over 1,000,000,000 acres to be disposed of under the homestead act. Not so much as one per cent. will be abstracted.

This heritage may be so heedlessly overrun as to be soon wasted, leaving behind nothing but the estate of a prodigal, or it may be so managed as to hold all comers and give them unsurpassed prosperity for centuries.

As soon as lands pass from the hands of the Government, they become subject to local taxation, and that is clearly to be desired by land States and Territories. The scrip issued will go into the hands of *bona fide* settlers, because such will be the only purchasers to be found, unless at a depreciation of price, and these will be obtained by the several States disposing of their scrip on a credit, and retaining the lien on the land. Such an arrangement will not certainly be to the disadvantage of the land States.

Saying nothing of what might be due from the new States to the old on the score of reciprocal generosity, by the present bill the land States will obtain their just proportion according to population, and it is not too much to say at the same time, that more young men will be beneficiaries of these institutions in other States who will become residents *of*, than will be educated *by* the land States themselves. These States, therefore, should

be more deeply interested in the measure than all others, and I invoke their Representatives to its just appreciation.

In a speech I had the honor to make in this House (April 20, 1858,) prior to the passage of the bill of which this is mainly a copy, I attempted to show, by the facts of the census of 1850, compared with those 1840, including other State returns, that there was a constant and widely pervading diminution of crops per acre under our go-ahead system of farming, and that the main relief sought was such as that practiced by flocks of wild pigeons, which no sooner strip and waste one field, than they take wing and fly further on.

If this deduction has any foundation, without some speedy and efficient remedy—reaching to every State; for there are none without more or less of lean-faced districts, poor farms, and poorer farmers—this agricultural decline will, at no remote time in the age of the nation, produce calamitous results. The census of 1860 is not yet published, so that a full comparison of another decennial period is impractible, and, if the latest census tables were now at hand, the statistical information is too limited to afford more than a meager account of what it would be useful, if not creditable, for us as a people to know and to spread out on the record. By the courtesy of the superintendent, I have gleaned some facts which still indicate, I regret to say, the retrograde march of agriculture, and showing that the positions heretofore assumed have only too much support in the census of 1860. The facts are by no means agreeable—not calculated to puff us up with pride—but they should be resolutely examined, to find, if possible, adequate measures of reparation predicated upon the wants of all the States.

By the returns it appears the New England States have increased their number of horses, but to about the same extent have diminished the number of oxen, and it would be hard to say whether the gain or loss is the most profitless. All of these States, except Rhode Island, have increased the product of butter, and all fall off in the quantity of cheese, as well as the number of sheep, swine, and (except Maine and Vermont) in the quantity of potatoes. Of wheat, the whole quantity produced is pitiably small, being only 1,077,285 bushels, and of that 431,127 bushels is produced in Vermont. New York, in 1850, produced 13,121,448 bushels of wheat, and only 8,681,100 bushels in 1860, showing a decrease of 4,440,348 bushels. The number of sheep in New York—

In 1840 was.....5,118,777
In 1850 was.....3,453,241
In 1860 was.....2,617,855

This State has nearly 2,000,000 acres or one-seventh part more land under cultivation than there was ten years ago, and yet the hay crop was less by 164,011 tons. The following table illustrates the position of New York:

	1850.	1860.
Horses	447,014	303,725
Milch cows	931,324	1,123,684
Oxen	178,909	121,702
Other cattle	767,406	727,837
Wool, (pounds)	10,071,301	9,454,478
Wheat, (bushels)	13,121,448	8,681,100
Sheep	3,453,241	2,617,855
Hay, (tons)	3,728,797	3,564,786
Swine	1,018,252	910,178

This is anything but complimentary to our system of agriculture, and yet few of the old States are doing so well as New York.

In seventeen of the States—nearly all the old—there has been a loss in the number of sheep, and the number in 1860 is 22,679,386, against 21,723,220 in 1850, or a gain only of 956,166 in ten years! But for the new States the loss would have been large, and the gain in the State of California (1,058,134) is more than equal to that of the whole Union.

Pennsylvania, with 46,000 square miles of territory, and 2,906,115 people, should raise as many sheep as England, with about 51,000 square miles of territory, and 17,000,000 people, and yet England has 30,000,000 sheep, and Pennsylvania but 1,631,540, which gives to England nearly two sheep for every inhabitant, and 590 for every square mile, while Pennsylvania has little more than one to every two inhabitants, and only 35 to the square mile. With our unlimited cheap lands, we should export millions of wool, but England, in fact has, the past year, supplied us with millions both of the raw and manufactured.

Flax and hemp, as crops, have nearly been blotted out of the Union, though considerable flax seed is still raised, to be crushed for the oil, while the fiber, the most valuable part, is thrown away. Home manufactures, in 1850, amounted to $27,486,219, but in 1860 they declined to $24,326,744; so that women, in this branch of industry so intimately related to agriculture, notwithstanding the 4,000,000 more of women, are really toiling and spinning less than ten years ago, and but little more than they appear to have done according to the statistical information recorded in the days of King Solomon.

The loss in the "hog crop," in many of the States is considerable, and not compensated even by whisky. Six States (Maine, Massachusetts, New Hampshire, South Carolina, Tennessee, and Vermont) produce less corn than they did ten years ago. The old States exhibit little increase of corn —scarcely equaling the marvelous growth of some single new States.

I have been furnished with the Ohio annual agricultural reports, containing statistical returns of that State—so creditable in matter and form that they deserve to be the model for her sister States—and these corroborate the positions assumed, that is to say, the fact of the increasing unproductiveness of our long cultivated lands. Ohio is a fair State to put on to the witness stand. She is wise, brave and rich enough to court the test, to declare the whole truth, in order to find a cure for any defects in time. This annual self-inspection, not less useful to States than to persons, discloses the real deficiencies, and all that is then needed is proper instruction as to the remedy. Ohio is the oldest of the great western States—large, populous, and neither old and worn out, nor young and undeveloped—the golden link between the old States and the new. Her fate may be anticipated by some, and will be followed, perhaps, with unequal steps, by all the rest. It will not soil a phrase of politicians to say, "as goes Ohio, so goes the Union."

By the reports referred to, it appears that 87,821 acres *more* land devoted to the culture in 1858 than in 1850, produced 1,454,412 bushels less wheat. (*Vide* Report 1854, p. 542.) The average product is also stated to be 11.35 per acre in 1858, against 18.78 in 1850, or a falling off of nearly

7.50 bushels per acre. That this is not confined to one season may be seen by taking the whole eight years after 1850 together, and the falling off was over four bushels to the acre for the entire crops. This proves the steady and unmitigated decline as to the whole State, whatever particular localities may exhibit, in the capacity of the soil, at the yearly rate of nearly one bushel per acre. The substances necessary to the production of wheat are in the process of being annually exhausted, and they are not returned, though not lost to the world where they go, for we have long fattened British Durhams according to the magnitude of our exports, and, I regret to say, British hate, by any diminution of our imports. It is no answer to say that the profits of the farmer have not diminished, because prices have advanced in even a greater ratio than the diminution of the crop. The fact will still remain that the land grows less and less capable of supporting its population. Other fields may open, but this is closing. Starvation, though distant, is still visible in the skeleton at the end of the road. Land that will not produce corn or wheat, may be devoted to some other crop, but the product is likely to be less valuable. It may sustain cattle, but not men. Grazing, properly conducted, may renovate the soil, but that husbandry, while it requires fewer numbers in its conduct, also supports fewer numbers. Its profits may be gratifying to the few, but they are banishment to the many. In China, few animals are raised for slaughter, because all the land is needed to supply food for man. In Ireland their live stock has recently increased, but Irishmen have sadly dwindled. Drive out men and you give room for brutes, but the change is not pleasant to contemplate.

It must be remembered that even the old States have a vast amount more of lands improved now, and a greater population than they had ten years ago, and from these causes alone should have made a large increase of crops. But it would appear that these new lands and larger forces are becoming necessary to counterbalance the deterioration of the older fields. It is a striking fact that the increased production is derived from new lands, either in the new States or lands freshly cultivated in the old States. The long cultivated lands appear to be declining at the very time when they should be advancing to a higher and more remunerative fertility. Our grain growing region is rapidly retreating westwardly. The States that now furnish corn to any extent beyond their own consumption are few in number, and destined soon to be less.

That there is a gratifying advance of agricultural wealth within the past ten years in many respects is true, but with our magnificent opportunity, and with an eye on the future, it certainly is not wholly satisfactory. We are in the rear of Europe, and that will never be satisfactory. The English have what they call exhausting, restoring and cleaning crops. But we seem to have got so far only as to adopt the exhausting crops. *There* capital finds the most solid security invested in land and its improvements. *Here* such enterprises spoil a man's credit on *the exchange*. The true system of farming would seem to be to make the land more fertile than it is in its natural state, and every succeeding crop better than the last. By our mode the earliest crops are seldom subsequently equaled, and the last are apt to be the worst.

The proportion of population of the United States engaged in agriculture in 1840 was 77.4 per cent., but in 1850 it had fallen to 44.69 per cent. In 1860 the percentage is doubtless still less, as we find the increase of population much the largest in towns and cities, and in some rural districts the population has positively diminished. Taking the cities and towns with over five thousaud inhabitants, the increase has been 60.43 per cent., and all the rest of the country only 31.96 per cent, or the former nearly double that of the latter. If all the villages, towns and cities should be included, the fact would be shown in a much stronger light. This tendency to desert the rural districts and to shun manual labor can only be checked by making the country more attractive and more remunerative. The architectural monuments of opulence have risen in the towns and cities at the expense of the more solid and pervading evidences of a nation's prosperity, which are to be mainly found in the unostentatious improvements of the buildings and cultivated fields of the rural population.

I will not attempt to enumerate what has been done and is now in progress by European nations to promote agricultural education. It would occupy too much space. It is enough to know that they all seem eager to place their people ahead in the great race for the mastery. Our nation has been the first to test the value of iron clad ships, but we lag immeasurably behind in improving the resources necessary to support such ships. The efforts of our foreign rivals are on the most liberal and persistent scale, and have thus far been in the main successful, and this is proven by their continued annual appropriations for this object. Among these governments, that of Louis Napoleon, as usual, occupies a prominent position. Many crops in France, within a few years, have been doubled; some have been quintupled; live stock has been doubled in number and value; and, while the profits of farmers and the wages of laborers have also been doubled, taxes on land have been actually diminished. The Second Empire may not claim credit for the whole of these improvements, but the services of the present Emperor have been so great, according to a late writer, "that one of the charges brought against him by his uncompromising opponents is, that these benefits have caused the nation to forget even that loss of freedom by which they have been purchased."

Coveting, as we do, American freedom, let us show that it is not held with the smallest diminution of other blessings, material or educational, so dearly purchased under other forms of government.

Ireland, with a soil of much more natural fertility, and a climate of far greater salubrity than England or Scotland, has been oftener threatened with the perils of famine than any other civilized country of the world. All this is traceable to bad farming, through a system possibly forced upon the people by political and social connection with England. They have raised grain crops in abundance and some cattle; but too poor to consume them at home, these have been sent to England, while potatoes remained the chief fare for gaunt Irish laborers. Even the bones of the few cattle slaughtered at home, carefully gathered, have been sent to England, where science and capital had made the discovery of their agricultural value.

After the failure of the potato crop in 1847, in the brief period of about

eight years, cholera and emigration reduced the population of Ireland from eight millions to six millions, or fully one-fourth, and those who remained were either too feeble to arrest the downward tendency of their soil to sterility, or they were preparing to emigrate, and therefore scourged the reluctant soil to bring forth one harvest more, and then, farewell! England could have borne the exodus of the Irish, but the vanishing rent was less tolerable. The Fishmonger's Society and others owned estates there, and these must be rescued. England deserves praise for the hearty manner with which she undertook the task of improving Irish farming and Irish farmers; and it is to be noted that no capital was used more effectively than that which has been and is being expended for the establishment and support of agricultural schools and colleges. Already the face of the country presents a nobler aspect; the number of cattle raised has been largely augmented; labor is better paid and fed; and we are now beginning to recognize Ireland as in fact the *Emerald* Isle, or the first grass country of the world.

Whether our own country is following the cast-off system of Ireland or not, is a grave question. If we export to England the virgin products of our soil, and those the most exhausting crops cultivated, the cereals, tobacco and oil-cake, it is a process which makes England a garden at the expense of American farms; and we may well forebode the day when it will be no longer possible to furnish cheap food to our multiplying and dependent millions, and certainly not possible to respond to the foreign demand of either commerce or famine. If it be true that the man who sells hay will soon raise no hay to sell, because there is no return of manure, the same result is equally apparent from the export of other crops upon the consumption of which on the farm the reproductive energies of the soil depend for supplies.

Should no effort be made to arrest the deterioration and spoliation of the soil in America, while all Europe is wisely striving to teach her agriculturists the best means of hoarding up capital in the lands on that side of the Atlantic, it is easy to see that we are doomed to be dwarfed in national importance, and not many years can pass away before our ships will be laden with grain not on their outward but homeward voyage. Then, with cheap bread no longer peculiar to America, our free institutions may be thought too dear by those of whom even empires are not worthy, the men with hearts, hands and brains, vainly looking to our shores for life, liberty, and the pursuit of happiness.

There is and can be no mode by which the resources of a country can be so fully developed as by educating the vast numbers who are to devote their lives to agricultural employments as tillers or owners of the soil. By this means each man is trained to bring into action his whole mental and physical force. The immense loss of power through ignorance is saved. The factory girls in America receive two or three times the pay that the same class obtain in other lands; but this is not all the generous gift of the employers, for they secure, in the better educated American girl, a superior and more valuable labor. Intelligent labor is found to be hardly too dear at any price. This is eminently true in agriculture. A dull, uncultured man, though physically a giant, does little work for which brute power might not often be easily substituted. He may move mountains, but the inevitable mouse only appears. The skilled and thoroughly trained farmer is sure to harvest larger crops and with less labor than his unskilled and untrained neighbor. Science, working

unobtrusively produces larger annual returns and constantly increases fixed capital, while ignorant routine produces exactly the reverse.

The mere dispersion of population over a wider territory improves neither the soil nor the cultivators of the soil, but both for the time are made rather the worse by experiments and theories which new conditions ever impose.

There are evils in an extremely dense population, but except in cities, our country as yet has reached no such point. The rural population is nowhere crowded. The new Territories, sparsely settled, naturally desire accessions. Their unoccupied spaces furnish none of the means to support a State. If they suddenly make drafts upon the old States to fill their vacant spaces, the aggregate wealth and power of the country is weakened, for not so much is contributed to the new as has been subtracted from the old. The dispersion tends to destroy, not markets merely, but that skill a dense population by a division of labor always assembles. Whatever advantages were held under the old condition of things have been abandoned, while whatever advantages may result from the new order of things are yet distant and imperceptible.

It is the destiny of many young men of the East to find homes in the West. They can only be retained on the Atlantic slope long enough to receive their education, and that will not repress their enterprise for travel. Foreign emigration and eastern combined, will bring gray hairs into the western prairies full soon in the life of a nation. "In every nook of the world where any good is to be got," it is said, "there is to be found a Scot, a rat, and a Newcastle grindstone," and perhaps it might be added, a *Yankee and a jack-knife.* Our young men will go, we expect them to go, but let them go laden with the spoils of the school house and college, a capital worth more than gold, and then they will prove of priceless value to our common country, wherever ultimately located, proudly and forever wearing the name of an American citizen.

It is of the highest moment that at this time we make no blunder in the guidance of the industry of the country, when all its resources must be taxed more severely than ever in all our previous history. While we are compelled to place most unusual burdens upon the people, none of whom can escape, let us pass one act they will all hail with delight. If they are made to carry weight, let them have some chance to increase their strength. The people are called upon unceasingly to do something for their Government, and they do not fail to respond because it is their Government, but it would not chill their patriotism if the Government should for once do something for them.

Undoubtedly agricultural chairs or professorships should be founded in all our colleges and universities. Every man owns or expects to own land at some period of his life, and it could certainly do him no harm to be taught how to manage landed property. If made a part of the regular course of studies, an opportunity would be given to acquire information that might in the changing circumstances of the world prove of the highest value in practical life. But these professorships, as important as they are admitted to be, would not satisfy the whole demand. The present institutions are hardly more than equal to the task of supplying the learned professions, so called, with their annual reinforcements, while others are wanted where the idea of labor shall be uppermost, and where the *esprit du corps* of those instructed will seek highest honor in no other direction.

It is true, nearly all the more modern sciences are, more or less, related to agriculture or the mechanic arts, and they are liberally recognized by professorships in most of our institutions of learning; but, as generally taught, there is little special application to agriculture or the arts. It is too far removed from any expectation of practical use, and, as with some merely ornamental branches, only so much of technical knowledge is given as it might be unpardonable for a gentleman to be without.

The prejudice against educated farmers arises from the fact that, while those usually styled such may be truly educated in some sense, they have no real agricultural education, and are no more fitted for their duties in that sphere than the aeronaut is fitted for a railroad engineer. When we have a race of educated farmers, men who have parted with their conceit for absolute knowledge, practically illustrating their education by their works, they will not turn out sailors on horseback, as it may be admitted some of the so-called book farmers have done. Merely practical men have looked at science as though it were a goddess in the clouds, to be worshipped only by fanatics and afar off, when it is really a handmaid, beautiful, and busy everywhere at saving labor and capital.

Men who are not farmers often by choice or chance have estates come into their charge, and then find themselves entirely unequipped, having had little theory and no practice, to manage them successfully. Such estates must be disposed of for the most any neighbor chooses to give, or the owner will have an outlay and not an income while it remains in such hands. This mortification could not happen if only general ideas of farming economy were more widely taught. That man only is independent who feels able to support himself and family by the plow whenever other avocations are closed; and he may feel sure his taste has become vitiated if he indulges the idea that other avocations are more fruitful of health, honors, or happiness, than that of the genuine American farmer. The business of agriculture is sometimes thought to be uninviting by those in other walks of life, and they shun any investigations of the great truths which underlie and surround it, as much as they would shun instruction in the craft of a tinker, lest they should some day be called upon to mend their neighbor's pot.

The experience of other nations in war, in arts, and in the sciences, is unhesitatingly resorted to, and all progress therein is appropriated as common property of the world; but in legislation, philosophy and education, reform based upon the most valid tests of foreign examples is treated with the coldest hospitality. It is not a sufficient reason because agricultural and military education has been extensively ingrafted upon the systems of other nations that the same policy should be transplanted here; but confuting the stupid idea that success is impossible, it is a reason why we should earnestly investigate the subject, and, if our necessities show that we stand in as much or more need than those who have successfully led the way, it is a strong argument why the policy should be adopted.

Popular common school education has been slowly combatting the prejudices of the world for generations. Starting from the Sunday afternoon catechism in Protestant Europe and America, it required two centuries to arrive at its present condition. At this moment the cause is receding in

Prussia, but gaining in England and elsewhere. We mock the timid pace with which other nations adopt our plan of universal education, but forget what laggards we are in an adjoining field where they appear so much in the advance. Whoever is at the lowest round of the ladder manifests the least inclination to rise, and those highest up have the most ambition for still greater achievements. Among the motives which should stimulate us is the desire to improve man himself, and added to this we have all that moves our great European competitors, namely, the increase of wealth and power. Manufactures take no step until agriculture produces a surplus beyond what is required for its own consumption, and from this surplus arises raw material and cheap bread, which make the arts and manufactures flourish. From these results commerce. Trade derives all its support from the basis furnished by agriculture and manufactures. Then follows the necessity of military and naval protection. In a free government we have proved, notwithstanding some, "in time of temptation fall away," that patriotism is spontaneous; but doubtless many valuable lives would have been saved in the progress of this plague-spotted rebellion had we not so long assumed that military discipline was also spontaneous. If ever again our legions are summoned to the field, let us show we are not wholly unprepared. These colleges, founded in every State, will elevate the character of farmers and mechanics, increase the prosperity of agriculture, manufactures, and commerce, and may to some extent guard against the sheer ignorance of all military art which shrouded the country, and especially the North, at the time when the tocsin of war sounded at Fort Sumter. This latter view becomes more important from the suggestive discovery that in any grave controversy the old Governments of the world are not our friends. Our obituary is the only service for which they manifest any alacrity. They would see us humbled. Clearly our growth is an eyesore to aristocracy. In peace they would buy and sell with us, but in war they would sell us and buy our enemies. Commercially they find us, when docile, at least useful; but politically they would shun as a pestilence that walketh at noonday. We can only be secure at home and abroad by being ready at all times to "ask nothing but what is clearly right, and submit to nothing wrong," and with Jacksonian nerve accept any responsibility of our position. The true way to nurse patriotism, after having institutions really worth a struggle, is to inspire our people with confidence, by giving them proper training, that they are equal to their mission and that failure is impossible.

Some may argue that the institutions proposed will turn out unsuccessfully. It may be that they will, but the object more than compensates the risk. If put into incompetent and unworthy hands, they will of course fail, and so would free government itself. But this would impute an imbecility upon the Legislatures of the several States they have not deserved. Let us not believe they will prove inert, helpless or wanting in capacity to develop so palpable a boon. I have faith in the sagacity of the people to profit by the experience of the world, and that they will mold these institutions in a form, and place them in charge of such men, as will secure permanent usefulness and enduring honor to the whole country.

SURVEY OF ORANGE COUNTY.

The county of Orange is one of the earliest settled counties in the State, and has been long esteemed as one of the leading agricultural counties. The Orange county dairies, and *Goshen butter*, are known in every portion of our country, as well as in every foreign country to which our sea-going ships have access. Its history is one of thrilling interest. The first settlement was made by the Huguenots in 1687; and the history of their trials and sufferings is given, showing the conflicts with the Indians, which continued for many years, as well as the trials of our revolutionary conflict. Its history as a dairy district is given in full; and its capabilities are not excelled by any county of like extent in our State. Mr. Denniston, long a resident in the county and familiar with its history, has prepared a report of very great value, and one that will be found most useful. The survey is divided into the following divisions:

PART I. Early history and settlement.
PART II. Source of title to land.
PART III. Geology, soils.
PART IV. Physiology of county, rivers, &c.
PART V. Political divisions and population.
PART VI. Climate and products.
PART VII. Farm houses and farm buildings.
PART VIII. Description, agricultural and manufacturing statistics of the several towns of Orange county—with a full summary of the statistics of the county.

Each of these heads is treated very fully, and will interest every reader. The importance of these surveys is being appreciated. We found, when abroad, that gentlemen who had seen our Transactions were very much interested in these surveys, giving in detail the course of husbandry, and impressing upon them the great capabilities of our country, as an agricultural country, when its resources should be fully developed.

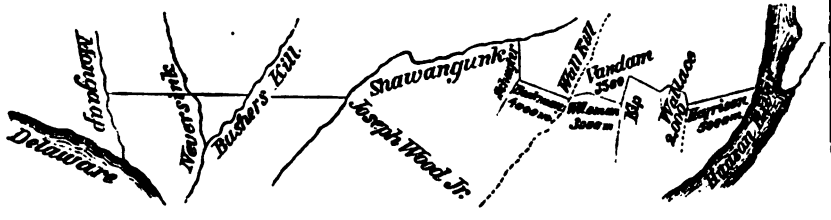
We are under very great obligations to Mr. Denniston for his excellent report. J.

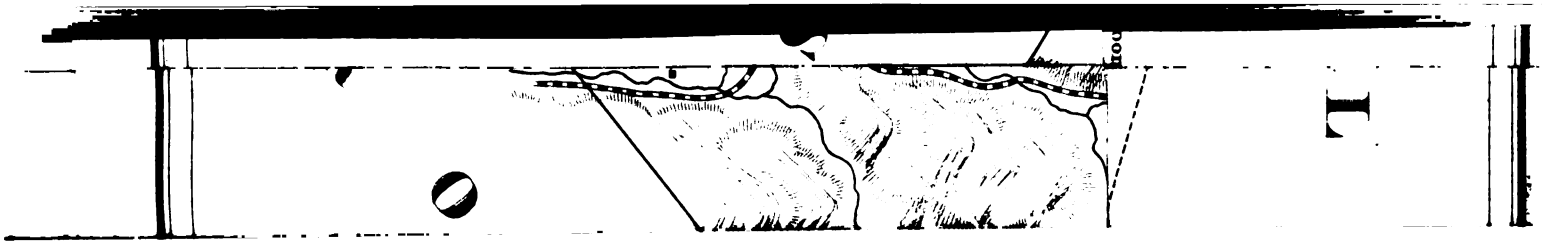
AGRICULTURAL SURVEY OF THE COUNTY OF ORANGE

The county of Orange was organized in 1683; and by the general organization of 1788 was described as follows: "To beginne from the ... or bounds of East and West Jersey, on the west side of Hudson's ... along the said river to the Murderer's creek, or bounds of the coun... Ulster; and westward into the woods as far as Delaware river." ... boundaries comprised Rockland county until the year 1798, when ... land was erected into a separate county, and the south towns of ... were added, giving to Orange its present boundaries.

The statute boundaries of Orange county are as follows: "Easter... the middle of Hudson's river; southerly by the county of Rockland... the division line between this State and the State of New Jersey; ... erly by the river Mongaap and the division line between this State an... State of Pennsylvania; and northerly by a line drawn from a point i... middle of Hudson's river, opposite the northeast corner of a tract gra... to Francis Harrison and company, called the five thousand acre trac... the same northeast corner, and running thence westerly along the n... bounds of the same tract and the north bounds of another tract grante... the said Francis Harrison, to the tract commonly called Wallace's t... then along the lines of the same, northerly and westerly, to the n... easterly bounds of a tract granted to Jacobus Kip, John Cruger, ... others; then westerly along the northeasterly and northerly bounds the... to the northwest corner of the same; then westerly to the northeast co... of a tract of three thousand five hundred acres granted to Rip Van D... and others; then southerly along the same to the northeast corner o... tract of three thousand acres granted to Henry Wileman; then along ... north bounds thereof to the Paltz river, commonly called the Wallkill; t... southerly up the said river to the southeast corner of a tract of f... thousand acres granted to Gerardus Beekman and others; then weste... and northerly along the southerly and westerly bounds thereof, to ... northwest corner thereof; then northwesterly along the north bounds ... the tract granted to Jeremiah Schuyler and company, to the middle of ... Shawangunk kill; then southwesterly through the middle of said kill ... the north part of the farm formerly in the occupation of Joseph Wood, Jr.... and then west to the said river Mongaap."

The northerly bounds of the county are very irregular, of which th... following is a diagram:





The county lies between 41 deg. 8 min. north and 41 deg. 38 min. north latitude, 2 deg. 7 min. east, and 3 deg. east longitude from Washington. It contains 778½ square miles; 498,214 acres, of which 308,599 are improved, and 189,615 are unimproved. The aggregate valuation of real and personal estate in the county were as follows: For 1840, $11,542,227; for 1845, $11,319,420; for 1850, $12,159,987; for 1855, $25,578,980; for 1859, $25,703,986; for 1861, $25,497,223. Total amount of taxes in 1861 $172 188.46.

PART I.—EARLY HISTORY AND SETTLEMENT.

In the month of September, 1609, Hendrick Hudson ascended the river through the Highlands. He found the native Indians friendly and anxious to visit the ship. Above the Highlands he found "a very loving people—very old men," and very hospitable. They came on board the ship, bringing corn, tobacco, pumpkins, grapes, beaver and other skins, and exchanged them for hatchets, knives, beads and other trifles. It was at this interview, between the Indians and the Dutch, that the first instance of intoxication occurred among the former, which event is still preserved in their traditions.

When the county was first discovered there were many small tribes of the Delaware and other nations living therein. They were generally located along the streams of water, and supported themselves by fishing and hunting. In many places, their burying grounds and relics of their implements for hunting and war, attest their original presence.

In a map drawn by Adrian Vanderdonk in 1656, the Indians living north and west of the Highlands, in Orange county, are designated as the "Waranawankongs."

The Indians were found located along the Wallkill through the central part of the county; along the Neversink and Basherskill in the west; along the Otterkill and Murderer's creek, also along the Quassaic in the east. They permitted the whites to settle down upon their lands in peace, having received some compensation therefor. Both parties seemed to have acted kindly and honestly towards each other, and, until the Indians leaving for the west, there was no ill-will or hostile disposition manifested. It was not until the French war, and the war of the revolution, that Indian hostility and barbarity were directed towards the settlers in Orange.

The first settlement made within the limits of Orange county was made by the Huguenots, who fled from France during the reign of Louis XIV. They fled to escape the rack and wheel of persecution; they came to the New World for rest from strife—for the privilege of worship and religious opinions, based upon conscience and the scriptures.

Twelve of these early settlers were, Lewis Dubois, André Lefebre, Lewis Bevier, Hugur Freré, Christian Deyo, Jean Hasbrouck, Anthoine Crispell, Isaac Dubois, Abm. Hasbrouck, Pierre Deyo, Abram Dubois, Liman Lefebre.

These emigrants passed passed up the Hudson river, and established themselves at the mouth of the Wallkill, in the year 1687. From thence, some of them passed down the valley of Mamakating as far as the Dela-

ware river, and settled in the Minisink country. Others passed up the Wallkill and settled along its whole course to New Jersey. From these old settlers we can trace much of the population of the towns of Montgomery, Crawford, Wallkill, Deerpark, Mount Hope, Minisink and Greenville.

Nicholas Depuis, Esq., who, in 1787, lived a few miles below the Minisink mine-holes, gave the following account of the settlement: "That in some former age there came a company of miners from Holland, supposed, from the great labor expended in making the road from Esopus, that they were rich; they worked two mines—one on the Delaware where the mountains approach the lower point of Paaguarry Flat, the other at the north foot of the same mountain, near half way from the Delaware and Esopus; that abundance of ore had been hauled on the road. The first settlers came from Holland to seek peace; they followed the Mine road to the large flats on the Delaware; they bought the lands of the Indians, who moved to the Susquehanna; that with such as remained there was peace until 1755."

On the 10th day of May, 1708, an order of council was issued, at the Court of Kensington, "for the naturalizing and sending certain Palatines to New York, who had been reduced to destitution in the lower Palitinat." These were sent to Quassaic creek and the Thanskamir. Their names were as follows: Joshua Kocherthal, (minister,) Hermanus Schuneman, Michael Weigund, Andreas Volk, the widow Plettel, John Fisher, Peter Rose, Jacob Weber, Isaac Turk, Lorenz Switzer, Henry Rennau, the widow Wemaren, Isaac Feber, Daniel Fiere.

In 1710, the number had increased to 257 men, women and children. The next year their total number were 356; and they furnished 38 volunteers for the expedition against Canada.

These Palatines settled upon a patent procured from Queen Anne, for 2,190 acres, and laid out a village plot which they named Newburgh. The patent was divided into nine lots, numbered from one to nine, and 500 acres for a glebe for the use of the church and ministers (Lutherans) forever. The Palatines became dissatisfied with the location, and previous to 1740 sold out to Alexander Colden, Richard Albertson, Edmund Conklin, Jr., William Ward, Thomas Ward, Nathan Truman, Jacob Wandell, Johannes Wandell, Daniel Thurston, James Denton, William Smith, and others, who petitioned the Colonial Governor "to renew the patent to them, being the purchasers from the Palatines who had left the place."

We find among the colonial records of the date of May 24th, 1743, "The humble petition of Alexander Colden, to the Hon. Geo. Clarke, Esq., Lieut. Gov.," &c., showing "that the petitioner is interested in, and entitled unto a part of the tract of 2,190 acres; that the petitioner is settled, and has made considerable improvements on part of the said lands; that there are now many settlements on both sides of Hudson's river; persons frequently have occasion to cross over from one side to the other; that the petitioner is willing to provide proper boats, and persons constantly to attend, for the tranportation of passengers, horses and goods across the said river, to and from the aforesaid tract of land, now commonly called Newburgh patent. He, therefore, humbly prays your honor will be favorably pleased to grant to him, his heirs and assigns forever, letters patent for the soil under the water, one hundred feet into the river, from high

water mark, the whole length of said patent, so that he may be enabled to make proper wharfs and landing places, and also for the establishing, keeping, and using of such ferry, as aforesaid."

In council, 24th of May, 1743, the committee reported favorably to said petition. The report was approved accordingly.

In the year 1753 Jonathan Hasbrouck purchased lot No. 1, and part of lot No. 2, of the German patent. Upon this purchase he erected the "old stone Hasbrouck house," (Washington's headquarters at Newburgh,) and also a grist mill on Quassaic creek, being the first mill built in this part of the county. This mill was afterwards owned by Gen. Nathaniel Dubois. The present proprietor is J. R. Dickson.

In 1753 Samuel Stratton purchased of William Elsworth one hundred and forty acres of land in Harrison's patent, and settled thereon, being the same lands now or lately owned and occupied by Mr. Samuel Clark, of Middlehope.

About the same time Joseph Penny purchased Wallace's patent, containing 2,000 acres, and settled thereon with his family of seven sons and one daughter. Rossville is located upon this patent.

In the vicinity of Orange Lake was settled, at an early day, Joseph Moose, upon the patent of Jacobus Kip. He gave name to the lake, and it was called "Moose pond," after which it was called Matchens pond, and recently Orange lake. William Wear, James Waugh and John Beatty settled on the west side of the lake, on the patent granted to Andrew Baird & Co. These were the ancestors of the families of those names now living in that vicinity.

James Renwick located upon part of lot No. 2. He laid out the east part of it, adjoining the river, into streets and blocks. He built a dock, where he did business, (now called Norris's dock.) Renwick sold to George Gardiner, Esq. Henry Robinson subsequently purchased it.

As early as 1735 Alexander Colden, a son of the Lieutenant Governor Colden, opened a store at "Coldengham," on the Johnson patent. This patent was procured in 1720, and the first settlement was made upon it by Cadwallader Colden in 1728. He erected the stone house lately occupied by David Woodruff. This house was long known as the "Coldenham Academy," being a military school previous to the war of the revolution. There was a grist mill erected about the same time, west of the Coldenham stone house; also other buildings on clearings remote from the highway. In 1742 Dr. Colden writes: "I have made a small spot of the world, which, when I first entered upon it, was the habitation only of wolves, bears and other wild animals, *now*, no unfit habitation for a civilized family. So that I, without vanity, take the comfort of not having been entirely useless in my generation."

In the year 1738 Henry Crist, Stevanus Crist and Matthias Miltzpatch bought of William Sharpus, one of the patentees of the Jeremiah Schuyler & Co.'s 10,000 acre tract, five hundred and forty-two acres on the north side of the Wallkill, opposite to the present village of Montgomery. Henry Crist located himself at the foot of the hill, east of the Dutch Church and north of the turnpike. Stevanus Crist built his house between the kill and the late residence of Joseph V. Wheelan. It was at this house that the first town meetings, at the organization of the town, used to be held. In 1785 Jacob Bookstaver, Frederick Sinsebaugh and Johannes Youngblood settled north of this place.

James Ward bought the two hundred acres, the present site of the village of Montgomery. Here he built a mill; and to enable the settlers on the west side of the kill to have access to his mill, he built a bridge, which was called "Ward's Bridge," which gave name to the village for many years. This bridge is noted for an expenditure of £1 6s. for rum drank at its raising, when rebuilt in 1790.

Johannes Miller settled on the bank of the Wallkill, two miles south of Ward's bridge, in 1727. He was from Germany, and came to this country the beginning of the eighteenth century. He located his house on the top of a hill, built it of stone, with doors and windows appropriate for defence, like some of the old fortified erections of his native country. The interval between Miller's location and Ward's bridge was soon settled by Lutherans from Germany. They located themselves upon the Francis Harrison patent of 5,000 acres, and changed its name to "Germantown." They laid out a road east and west from the Wallkill into the Thomas Noxon's patent, and upon this made their clearings and built houses. They also built a church, and inclosed a burying ground, in which many of these pioneers and their descendants are now resting.

The names of some of these Lutherans are still preserved in this vicinity. The descendants of Dederick Shafer are quite numerous, while those of Matthew Newkirk, Jacob Pitts and Hanse Smith are still living in different towns of the county.

In the year 1741 William Eager, the great grandfather of the late Samuel W. Eager, Esq., deceased, located himself upon several hundred acres at a place afterwards called "*Neelytown*," after John Neely, who settled there about the same time. Charles Booth also settled there shortly after. Of the settlers in this part of the county, the most of them being Germans, consequently aliens, it became necessary for them to become "*naturalized*," in order to enjoy all the rights and privileges of citizens. A bill was passed in 1735 for naturalizing the following persons, viz: Matys Milsbagh, Hendrick Crist, Stephanes Christ, Larens Crist, Philip Milspagh, Jacob Booch, Jacob Sinsebagh, Jacob Boochstaver, Johannes Bloet.

Henry Wileman made a settlement in 1709 upon his patent of 3,000 acres, about a mile below the present village of Walden. He divided his patent into lots in 1712. Mr. Wileman was the first lawyer on record in the county. He was free, open and noble hearted. He was a "*freemason*," and erected a building where the order met at stated periods. It is said that when he died certain honors were designed to attend his funeral, but the customary supply of liquor upon the occasion prevented their being carried out. The place was long known by the name of "*Wilemantown*," and was lately owned and occupied by Peter Neaffie. About one mile above this place a grist mill was erected on the east side of the Wallkill, at the foot of the falls, by Mr. James Kidd, who had settled there. This mill accommodated the neighborhood until another was erected lower down the kill by Stephen Gilbert, which is now known as the Galatian Mill. The mill erected by Kidd has been converted into a cotton factory, and lately occupied by the Caprons.

A settlement was made on the Dwars Kill in 1738 by Johannes Snider. He erected a log mill here, which was long known as "*Snider's Mill*" He also built a church, also known as "*Snider's Church*," in which the gospel was

preached in Dutch for a long time. This place is now known as "*Searsburgh.*"

About the same time Mr. Robert Millikin built a mill on the Shawangunk Kill. Put Boice had erected one further up the stream, and Slott lower down. This latter mill is located at the small hamlet now called "Pine Bush."

In 1731 came from the county of Longford, in Ireland, Col. Charles Clinton, Alexander Denniston and John Young. These emigrants were three months upon the ocean, when it was discovered that the captain of the ship intentionally caused this delay, in order to possess himself of their money and effects. Upon the discovery of his design, the captain was seized, put in irons by the passengers, and the command given to the mate, who brought the vessel into New York in a few days. The wife of Col. Clinton died on the voyage, and he afterwards married a sister of Alexander Denniston.

These emigrants settled in what was then called the "*Precinct of the Highlands.*" Col. Charles Clinton bought a part of the Cornelius Law patent. Alexander Denniston purchased a portion of the Andrew Johnson patent, and John Young located himself further northwest. The whole settlement was called Little Britain. This was at the time a "*frontier post,*" and their dwellings were fortified as a security against the Indians.

Col. Charles Clinton was afterwards appointed a judge of the common pleas of Ulster county, and in 1756 a lieutenant colonel in the expedition against Fort Frontenac, in Canada. He was the father of Gen. James Clinton, of revolutionary fame; also of George Clinton, who was Governor of the State, and afterwards Vice President of the United States. Gen. James Clinton was the father of the late De Witt Clinton.

Alexander Denniston had five sons—George, James, William, Alexander and John. James is the grandfather of the Hon. Robert Denniston, also of the writer of this report.

Adjoining the settlement of Alexander Denniston in Little Britain was "*Stonefield,*" occupied by the Rev. John Moffat as a grammar school, where the late Gen. James Wilkin and De Witt Clinton were afterwards educated.

The London Missionary Society, in 1732, sent out the Rev. Richard Charlton as missionary to the parish of New Windsor, which parish then included all the settlements far into the interior. The village of New Windsor was laid out in 1749, and among the early patrons of the place we find the names of William Ellison, Henry Case, Vincent Matthews, and Isaac Shultz.

John Ellison, the brother of William, settled west of New Windsor, in 1733, and in 1735 erected a stone house, one and a half stories high, with dormer windows, after the style of the cottage farm houses of old England. This house is now in good repair, and is owned and occupied by Major Morton. Mr. Ellison also built a grist mill near by, which is still standing.

Plum Point was settled at an early day by a Scotchman, named McEvers, who built his house above the place where the old battery was afterwards located in the Revolutionary war. Gen. Haskins settled on the lands east of Snake Hill, near where there was an Indian burying ground. This location was afterwards known as the Duzenbury farm. It was upon this farm that Washington erected a large temporary building, called the Temple, for the purposes of a church for the army, and other public services, when the army was encamped in the vicinity.

In 1729 James Edmonston settled upon 200 acres of the Ingolsby patent, and built his house, which was the only house then between New Windsor and Washingtonville. The Indians were then quite numerous in this vicinity, and their burying ground occupied several acres. Their chiefs they buried on Schunnemunk mountain. Their dead they put in their graves standing, with pipes, tobacco, scalping knives, and other articles; then amid drinking and whooping they would cover up the corse, raising quite a hillock over it. We have seen many of these Indian graves along the valley of the Otterkill, looking like small hay stacks. There was, as late as 1814, quite a cluster of them one mile south of Washingtonville, near "Brook's Bridge," but the plow share has passed over them, and they have passed from observation.

In 1731, Thomas Goldsmith purchased of Pinhorne Moppesson the one thousand acre tract, known as the Roger Moppesson patent, and adjoining on the west the Rip Van Dam patent. He located his house on the west shore of the Otterkill, being then the *second* house west of New Windsor. About one mile below, on the north banks of the kill, was Marigamus Wigwam, the residence of one of the last Indians who lingered amid the scenes of his nativity and the graves of his kindred. This wigwam was made a point to determine the starting corner of the Rip Van Dam and other patents. It is now the the residence of a white family, and ought to be preserved. Thomas Goldsmith, who was the original settler, is the maternal great grandfather of the writer, and many of his descendants now reside in that vicinity. The village of Washingtonville lies partly on his purchase, and partly on the Rip Van Dam patent.

Christopher Denn, in 1712, becoming interested in a part of the Wawayanda patent, settled upon the west bank of the Otterkill, after a preliminary visit. Denn sent Sarah Wells, a girl sixteen years old, with some Indians, as guides, and hired men, up the river to New Windsor, and thence through the wilderness to the place of their destination. There they erected a wigwam, and inducted the girl Sarah as the *first* to enter the new abode, otherwise it would be an unfortunate residence for the occupants. Tradition says "that Sarah Wells was the first white woman, and Madam Denn the second, who first came upon the Wawayunda patent, which laid in the town of Goshen." Sarah Wells afterwards was married to William Bull; received 100 acres of land from Denn. They erected the old stone house at Hamptonburgh, which has withstood the wear and decay of 135 years, and is now in the occupation of one of their descendants. The descendants of William Bull and Sarah Wells are more numerous than those of any other of the original settlers. In 1796, they numbered altogether 335.

In 1847, the writer spent an evening with Ebenezer Bull, who then owned and occupied the house, and was informed by him that "three generations of *his* family numbered twenty children each. His grandfather, who lived in the house, had twenty sons and daughters, who all lived to full age; his father also had twenty, who all lived to grow up; and that he had that evening twenty children in the house, all of them rugged and healthy." Mr. Bull himself was a fair specimen of a patriarch in the midst of his children, and the whole family exemplified the ideal of that of a substantial farmer.

When William Bull first settled in Hamptonburgh the nearest mill was at Fishkill, in Dutchess county, to which he usually took his grain to be ground.

Often he would shoulder his bag and carry it there and back in two days. On one occasion he did not return as usual, and his wife tied her infant child to the bed post and went to meet him. She met him half way to New Windsor, tired and weary, and *helped him along the remainder of his way home.*

Daniel Cromline having purchased an interest in a part of the Wawayunda patent, settled upon it in 1716, where he built what was for years after known as the "Grey Court House." This house was on the north edge of the Grey Court meadows, and on the farm lately owned by Jesse Carpenter. This house was about five miles southeast of the house built by Christopher Denn. It was for years the largest and the best house in all the country west of the Hudson river. It was for a long time kept as a public inn, and was a place of resort from all quarters.

About the time that Cromline settled at Grey Court, settlements were made by John Everett, John Carpenter, John Yelverton and others in Goshen. A deed of trust was made of the one-sixth of all the lands, of this part, of the Wawayunda patent, to the intent that a township should be laid out. According to these provisions a township was laid out, and two tracts of 70 and 61 acres were surveyed for a parsonage, and nine acres for a burying place, a minister's house and school house, as the town should order.

The village of Goshen was laid out by running a wide avenue north and south, half a mile long, and laying off four lots of eighty acres each on both sides of it. The church and academy lots were located at the south end. An oblong square was also laid out, of several miles in extent, which was designated as "Goshen township."

The wide avenue of the village of Goshen was the dividing line between what were called the "East division" and "West division" of Goshen.

A church was organized in Goshen in 1721, and in 1737 authority was given "to build a court house and jail for the county of Orange, north of the Highlands, at Goshen."

William Bull settled on his patent on the Wallkill of 500 acres at quite an early day, and south of this Mr. John McCord settled, building his house with small loop-holes for defence. This family was attacked one night by some Indians, but they were defended, and the Indians driven off. In the morning a track of blood leading to a high hill in rear of the house led them to discover that an Indian had been killed by the name of "Jerrard," which gave name to the hill afterwards.

John McNeal settled on the McCormick's kill, and built a flour mill, and in the vicinity resided Charles Borland, the ancestor of the late Charles Borland, Esq., of Montgomery.

John Wisner was the first settler on the Wallkill, at the place now known as Philipsburgh. Mr. Moses Philips married a daughter of Mr. Wisner, and with her received the property. During the revolutionary war Mr. Philips manufactured powder for the army of Congress at this place, which was made and furnished to the satisfaction of the government.

Mr. Murray, a descendant of George Murray, of Inverness, in Scotland, first settled at Middletown. He is the ancestor of Ambrose S. Murray, Esq., of Goshen.

Several families from Scotland, named McCarter, McVey, McWhorter, McInnis, McLaughlin, and McCord, settled along a high ridge of hills north

of Philipsburgh, naming their settlement Scotchtown. This place is about one thousand feet above tide water, and commands a view in every direction of from twenty to thirty miles distant.

Col. Dugald Campbell, from Scotland, settled on the Otter kill in 1738, giving name to the place "Campbell's Hall," by which it is still known. Adjoining this, Samuel Watkins located about the same time, and further east James Faulkner made a settlement.

In the year 1697 Arent Schuyler received a grant for a tract of land in the Minisink country, called by the Indians "*Warensaghskemick*," containing 1,000 acres. Also, Jacob Codeback, Thomas Swartout, Ian Tys, Peter German and others received a grant of 1,200 acres. These two grants were situated in the valley of the "*Peenpack*." These men settled on their lands, together with Hermanus Van Inwegen, and their descendants still own portions thereof at the present time. This was the favorite country of the Indians, affording fine fishing and hunting grounds, and was thickly settled by them. From the words of the Wawayunda patent it would seem that no less than twelve Indian chiefs claimed the whole or part of the country. These settlers built their cabins adjacent to each other near a spring from which ran a brook of clear water. This place was called "Peenpack," indicating "a knoll or hill by the brook." Shortly after John Deeker, William Cole, Peter Cuykendall, and Solomon Davis settled near by.

The farming implements used by these early settlers were of Dutch construction. The plow had on the forward end of its beam an axletree upon which ran a large and a small wheel, the large wheel to run in the furrow, and the small one on the unbroken land. The sickle was a crooked knife, similar to a "hemp hook"—a hook fastened into a wooden handle to gather the cut grain into gavels and sheaves. The thrashing was done with a flail, or trod out by horses, and the grain cleaned by means of a large fan made of willow rods. Their wagons and carts were made all of wood, the wheels without tires. Their harness were of ropes, the collars and neck straps were wove of rope yarn. The winters were spent by the men in thrashing out, cleaning and marketing their grain, the nearest market being Esopus, and by the females in spinning and weaving. These were the *halcyon days of domestic industry*, and notwithstanding many deprivations, they were marked as honest, truthful and happy.

These settlers had a long controversy with the authorities in New Jersey growing out of the uncertain line between New York and that State. The line claimed by New Jersey ran through the 1,200 acres, and the claim for a time was sustained by lawless violence. In November, 1700, an act was passed by the general assembly to "confirm the grant to Swartout and company, and to settle the bounds between this province and New Jersey." But it was not until after many acts of violence, and much disputation, and as late as 1767 by the establishment of a new line between the colonies, that the personal affrays and the border disputes were terminated.

A family by the name of Denton settled at an early day on the west banks of the Wallkill, at the place now called Dentonville, and about two miles west Isaac Dolson located himself upon 700 acres, and Daniel Cooley on 100 acres adjoining. During the French war a Mr. Owens was killed at this

place by the Indians, who were settled in great numbers all around, and had their burying ground on a dry knoll near by. Mr. Isaac Finch settled on 100 acres on the Mohagan creek, and built a mill thereon.

Gilbert Walsworth settled at the place now called Grahamville, Benjamin Dunning settled at the place now named Ridgebury. He was followed by John Hallock, James Halse, Jonathan Bailey, Richard Halse, Isaac Decker and others.

Daniel Burt, the father of the late James Burt, Esq., came from Connecticut and located himself in Warwick, where he remained four years, when his relatives came and found him isolated and alone in the wild woods. He was persuaded by them to leave, "as he could not get along in such a wild place." He sold out to Thomas and Edward Welling and moved back to Connecticut. He came back in a year or two after and purchased a farm at Bellvale on the Long House creek, which contained a fine water power upon which he erected a flour and saw mill. On the farm he sold to the Wellings was an Indian settlement called "*Mistucky*," where they had an orchard of apple trees, some of which remain standing in a meadow.

At the time Daniel Burt returned, Daniel Whitney came with him, married his sister and located; also David Benjamin, John Vance, Philip Ketchum, John Knap, and Thomas DeKay, came in and settled soon after. Thomas DeKay was a colonel of the militia, and a justice of the peace for Orange county, and took an active part in the controversy between New York and New Jersey, against the latter State, in reference to the State line. Upon his refusing to hold his lands under New Jersey, and become a "*Jerseyman*," a number of armed men from New Jersey came to his house and drew up before his door, swearing they "would shoot him through the heart, starve him out, burn his house and kill his family unless he complied with their demands." They boasted "they had men enough to take all Goshen, and would do it." DeKay defied them to *take him*, and after a long parley, and hard talk, they left with the caution and the threat "take care of yourself for we will have you yet," but they never got him.

Francis Baird settled where the village of Warwick now stands. He built the stone house which is now standing in that village. Henry Wisner also settled on the elevated ridge northwest from the village, the highest point of which is called "Bill Hill," and overlooks all the eastern part of the town.

William Armstrong, of Scotch origin, came into this town from Ireland, and settled near by. The name was given to the *first Armstrong, Highland Chief*, for his great courage and strength. In the "Lay of the Last Minstrel," Scott makes the chief say, in summoning the clans,

> "Ye need not go to Liddisdale,
> For when they see the blazing vale,
> Elliotts and Armstrongs never fail."

There was a settlement at an early day, 1730, also a missionary station called St. David's Corners, where Jonathan Brooks and Johannes Decker afterwards located themselves. Vincent Mathews was an early patron of the church and lived in the vicinity. He was born in the county, and in

1789 left for Tioga county, then part of Montgomery, and practiced law in Bath, Steuben county, and afterwards at Rochester, where he died. He was regarded the father of the bar of Western New York, and was highly estimated in all the walks of life.

The Cheescocks' patent covered a large portion of the town of Monroe, and portions of it, along the valley of the Ramapo, were settled about the year 1738. An old family by the name of Smith made an extensive settlement, and gave the name of *Smith's Clove* to that district of country from the Highland Mills down the Ramapo. The name was afterwards changed to Cheescocks (after the patent), then to Southfield, and afterwards to Monroe. Among the old settlers in this town, we notice the names of the Galloways, the Millers, the Wygants, the Slaughters, the Lamareux, and Wards.

Colonel Jesse Woodhull made a settlement in Blagg's Clove in 1750. He was then but 18 years old, and bought 500 acres of land upon which he located himself; some of which is still in possession of his descendants.

About the year 1740, Nathaniel Dubois, the grandfather of the late Gen. Nathaniel Dubois, made a settlement at Salisbury, where he owned 1,500 acres of land upon both sides of the Otterkill. He occupied the old stone house just west of the village. This place was then in "the precinct of Goshen." South of this were settled families named Helme, Halsey, White, Tuthill, Coleman, and Moffatt.

Some of the Palatines came and settled south of the Murderer's creek, in Cornwall, the beginning of the eighteenth century. They made there the first clearings, and erected their log cabins, and planted an orchard. In a few years they sold out and left. They were followed by the Townsends, the Sackets, the Sutherlands, the Van Dusens, the Sands, Mandevilles and Clarks.

Washingtonville received its first growth and inception from a few enterprising business men who located themselves there, and by their enterprise and industry called together a thriving population. About the year 1810, Shadrach Cooper opened a tavern and blacksmith shop, Mr. Samuel Moffatt opened a store, Marvin Giles a wagon-maker's shop, John Jaques and Moses Ely a shoe and boot shop and a tannery. From these beginnings the population has increased, and the place has become the mart of a considerable business. The old Richard Goldsmith farm adjoins it on the west, and the Brooks farm on the east.

A forge and a powder-mill was erected in 1777 at a place called *Craigville*, near *Gray Court;* and in 1790, James Craig, the father of the late Hon. Hector Craig, commenced the manufacture of paper—the first in the county. This manufacture was continued for many years.

James Satterly erected flour and saw-mills on the Satterly creek, about six miles south of Washingtonville; and Asahel Coleman, mills about two miles south of the same place.

Mr. Jonas Williams came from Long Island and settled at Murderer's creek, where Samuel Brewster owned a forge. He married his daughter, Abigail Brewster, and afterwards became the owner of the estate, and for many years prosecuted the manufacture of iron. The forge contained four fires, and had an anchory attached. The bar iron used in constructing the

chevaux de frise from Pollopels Island to Plum Point in 1777, was made at this forge; the ore was transported from the Forest of Dean, in Monroe, in packs, on the backs of horses—there being no roads for wagons through the mountains.

Colonel James McClaughrey came in and settled in Little Britain, adjoining the Clinton place, in 1740. He married Miss Caty Clinton, a sister of Governor Clinton. He was a *brave, lion-hearted man*, fought like a tiger at the taking of Fort Montgomery, and was taken a prisoner and carried to New York. Before his capture, one of his men told him he had lost his gun, and asked what he should do. The colonel shouted, in tones of defiance: "*Hurl stones upon the damned tories!*". By his will, Colonel McClaughrey gave all his negroes their freedom and good farms, or money to buy land. They located themselves at "*Honey Pot*," in the town of Wallkill.

Orange county was the theatre of many incidents of war from the year 1755 to the close of the war of the revolution. In the war between England and the French the Indians took sides with the French; and in the revolutionary war, with the British and tories.

The settlements in the Minisink country were composed of an upper and a lower neighborhood. Three small forts were built in each, and the families numbered about thirty at the commencement of the French war. The Indians who joined the French left and went to Cochecton, but often returned to the valley of the Neversink in guerrilla bands for purposes of murder and plunder. They would often lie in ambush, and, when opportunity offered, rush upon men at work in the fields and kill them. On one occasion, a band of them watched an opportunity to take one of the lower forts; and supposing that there were no men in it, they rushed to the assault; but it happened that some soldiers had entered the fort unperceived by the Indians, who, after a desperate defence, compelled them to retire. Several were killed on both sides.

They also attacked one of the upper forts; and during the assault the edifice took fire, and the defendants were obliged to fly. In their flight they were all killed except one woman, who got out unperceived and secreted herself under the bank of the river until night, and afterwards fled to the fort at Gumears.

After the French war, some of the Indians returned to the settlement, and remained until the war of the revolution. An intercourse was kept up between them and the settlers in the barter for skins, venison, &c. The principal depot for this trade was at the store and tavern of John Westbrook, where they disposed of their peltry and obtained liquor in return. This continued until the war of the revolution, when hostilities were again renewed. Early in the year 1777, they attacked the family of Mr. Sprague in the north settlement, and also of Mr. Brooks—some of whom they killed and took the others prisoners.

These indications of hostilities alarmed the people. They appointed a committee of safety, who directed scouting parties to watch the frontier as far as Cochecton, who apprehended persons suspected of aiding the enemy and imprisoned them. They ordered the erection of forts at Peenpack. The committee of safety consisted of Benjamin Depuy, Philip Swartwout,

Thomas Kytle, and Harmanus Van Inwegen. At this time there were about fifty families within the settlements. The women were sent away for safety, and the men garrisoned the forts. Brandt, with a force of 100 Indians and tories, invaded the settlement. They attacked the house of Mr. Westfall and killed one man. They next attacked that of Mr. Swartwout, who had two sons shot in the assault, and Swartwout and another son were taken and killed. Their next attack was on Fort Gumear, of which Captain Cuddeback had command. He, by a ruse, kept the Indians from coming within gun shot, and they passed on to Fort De Witt. They burned all the houses in the vicinity. These aggressions continued until July, 1779, when Brandt, with his Indians and tories, invaded the lower neighborhood. There he took Fort Decker, assaulted the house of James Van Vliet, where Captain Cuddeback killed an Indian with his naked hands by hurling him to the ground. From this they went to the school house of Jeremiah Van Aiken, whom they killed; also some of the boys, while the girls stood bewildered. Brandt rushed in, and with a brush dashed some paint across their aprons, bidding them "hold up the mark when they saw the Indians coming, and it would save them." The Indians seeing the mark passed away leaving the girls undisturbed. Some of the boys were also saved by the same sign.

Brandt by rapid and secret marches assaulted houses and forts; the war-whoop and the tomahawk gave the first indications of their approach. Horror stricken and unarmed the settlers fled from their burning dwellings. Some were killed, many were taken prisoners, and a few escaped to Goshen. Houses and barns were burnt, forts destroyed, farms laid waste, and the cattle driven away.

When the alarm was given by those who fled to Goshen, orders were immediately issued for the officers of the militia to turn out with as many volunteers as could be raised the next day. At the time appointed, about 150 men were assembled, at the head of whom was Dr. Tusten, their colonel. The doctor, doubting the expediency of pursuing the enemy before the arrival of reinforcements, called a council of war. In the midst of their deliberations, Major Meeker mounted his horse, and flourishing his sword, cried out: "Let the brave men follow me; the cowards may stay behind." This decided the question, and the pursuit was continued through the day. On the next morning, Col. Hathorn, of Warwick, joined them with a small reinforcement, and took the command. At Half-way Brook, where the Indians had encamped the night before, another council was held. Most of the officers were opposed to further pursuit, as there was no doubt of the superiority of the Indians and Tories in numbers, but the council was broken up in the same manner as the former, and the march was resumed.

Captain Tyler, who was sent forward with a small scouting party, had proceeded but a short distance when he was shot by a lurking enemy. And when the volunteers came in full view of the Delaware, they discovered the enemy marching towards a fording place near the mouth of the Laxawaxen. To intercept them before they reached the fording place now became the object of Colonel Hathorn.

Brandt, skilled in all the arts of war, and prompt in securing the advantage, threw himself in the rear of our forces, and was thus enabled

to form an ambuscade, and to select his own time and place for action. On reaching the Delaware, without intercepting the enemy, Hathorn halted his men, in order to ascertain the course they had taken. At this moment Brandt discovered himself, and demanded of Hathorn "an instant surrender." This was answered by a volley of musketry, and the firing soon became general. Brandt, being in greater force, in a short time was enabled to surround our troops on all sides, and to pour in upon them a deadly fire. The fight became very severe and irregular, every man selecting his own defence, and firing as chance afforded an opportunity. In this manner the fight continued through the day, until about sundown, when the ammunition of the Americans failed, and they attempted to retreat. The Indians, raising the warwhoop, rushed forth with the tomahawk and scalping knife, and a general massacre ensued.

Dr. Tusten, and about twenty who were wounded, were all killed, and of the whole number of volunteers only thirty escaped. Brandt saved the life of Major Wood because he supposed him to be a Freemason, having received a "sign of distress" from him. He killed Gabriel Wisner, alleging that he was wounded past all hope of recovery, and to put an end to his sufferings was an act of kindness. The killed and missing amounted to 119—among them were many of the first citizens of Goshen, Warwick, and the neighboring settlements. The slain were left to bleach on the battle field until the summer of 1822, when, with appropriate ceremonies, they were collected, and deposited beneath a monument at Goshen.

The late Dr. Merritt H. Cash, by his will, left $4,000 for the purpose of erecting a more suitable monument to perpetuate the memory of these worthy dead, which was finished, and dedicated with imposing honors, on the 22d of July, 1862, being the 83d anniversary of the battle of Minisink.*

During the war of the revolution the Highlands of the Hudson river were the scene of military operations. Forts Montgomery and Clinton, West Point and New Windsor, are names associated with our struggles for independence. On the 6th day of October, 1777, the British, under Sir Henry Clinton, 5,000 strong, invested these forts, and, after a strong resistance, they were taken. George Clinton, in a letter written the day after, says: "I posted my men in the most advantageous manner for defence of the post, and it was not many minutes before this, as well as Fort Clinton, was invested on all sides, and a most incessant fire was kept up until night; and soon after dusk the enemy forced our lines and redoubts at both posts, and the garrisons were obliged to fight their way out—as many as could—as we were determined not to surrender, and many have escaped. Officers and men behaved with great spirit, as well continental troops as militia. Our loss in slain cannot be great, considering the length of the action.

* This monument is 32 feet high, exclusive of the base. The lower base is of granite, 7¼ feet square, upon which is a marble base, 5½ feet square. On the marble base rests a die, 4 feet in width and 4½ feet high, upon the sides of which, in bass relief, is a proper inscription to the donor. The cap on the die is 1½ feet high, and 5½ wide, and has upon each corner an eagle. Sitting between the eagles, and immediately in front of the shaft, is a figure representing the Goddess of Liberty, holding in one hand a wreath, while the other hand rests on a national shield, and over the head are the words "They still live." The shaft is 12½ feet high. It has upon its front national symbols, and is surmounted by a pedestal of 2 feet, on the top of which is a figure 5 feet high representing Hope.

My brother, General Clinton, is wounded, also Major Logan. I greatly regret the loss of these posts, but am consoled with the full persuasion that they have bought them dear, and that I have done the most in my power to save them."

From a deserter, who was afterwards taken, it was ascertained that Gen. Sir Henry Clinton commanded in person, assisted by three general officers, their force was 5,000, and that their loss was very great.

While West Point was being fortified, a young lady, by the name of Moncrieff, rode near our lines and was taken prisoner. While thus held, she employed her time in drawing plants and flowers, which she executed with great taste and skill. It was discovered by an officer that under the shading of the flowers and plants *some faint lines were drawn, which, when connected, was a complete draft of all the works of defence, as recently erected,* which she intended to impart to the enemy. She proved to be a spy in petticoats.

West Point, being the most advantageous position for commanding the river, was selected for that purpose. The rocks protrude far out into the river, impelling the waters to the opposite shore, and narrowing the channel to less than half a mile in width, was selected for Fort Clinton, while another eminence commanding the whole was chosen for the site of Fort Putnam. On the opposite shore, Constitution Island, batteries on a level with the water were erected, and a heavy chain, cramped into the rocks at either end, stretched across the river, and, supported by buoys, was intended for an effectual bar. This post was much desired by the British, and its surrender was to have been the first fruit of Arnold's treason. This was fortunately frustrated by a timely discovery, and the place saved to the country and to the cause of independence.

In the spring of 1783, when the troops lay at New Windsor, and were about being disbanded without their pay, there was great discontent among them. An anonymous letter was addressed to the officers and men, artfully calculated to excite their passion. Washington noticed the anonymous address, in his orders to the army, with pointed disapprobation, and requested the general and field officers to hear the report of the committee deputed by the army to Congress. This request was seized upon, and represented, in a second letter, as giving sanction to the proceedings of the officers, and they were called upon to act with energy.

On the 15th of March Washington addressed the meeting of officers in language of feeling and affection. (Gen. Gates was in the chair.) He overthrew all the artifices of the anonymous writer, and exposed their fallacy. He spoke of his own constant attention to the wants and sufferings of the army, and pointed out the dreadful consequences of following the advice of the writer, either to draw their swords against their country, or to retire, if the war continues, from the defences of all they hold dear. He closed with saying: "I conjure you, in the name of our common country, as you value your own sacred honor, as you respect the rights of humanity, to express your utmost horror and detestation of the man who wishes, under any specious pretences, to overturn the liberties of your country, and who wickedly attempts to open the floodgates of civil discord, and deluge our rising empire in blood."

The convention resolved, unanimously, that the army have unshaken confidence in Congress, and view with abhorrence, and reject with disdain, the *infamous proposition* of the anonymous address to the army. Thus was the cause saved from civil strife and war.

The inhabitants of all the southern part of the county suffered from a nest of traitors, tories, and a gang of robbers and plunderers called "Cow-boys." Among these, and foremost as a leader, was Claudius Smith, and his sons. Claudius was a bold villain, and was noted for being vicious from his youth, so much so that his mother said to him: "Claudius, you will die like a trooper's horse, with your shoes on." He was a man of large stature and powerful nerve. He was a tory of the most desperate character, and he committed depredations alike upon public and private property. He, with his gang, on the night of October 6th, 1778, broke into the house of Major Strong, and killed him as he approached them. Indeed his robberies were so many, and his acts of villainy so daring, that Gov. Clinton offered a reward of $1,200 for his apprehension, and $600 for his sons, Richard and James. Claudius was taken on Long Island one dark night, and was brought to Goshen, where he was tried, condemned and executed. It is said that when he ascended the gallows he remembered the warning of his mother, and in order to make her a liar, kicked off his shoes and died in his stockings.

Claudius had three sons. Richard and James were hung, and William was shot in Schannemunk mountain, and died soon after of his wounds.

Another of the gang, named Benjamin Kelly, was shot in the mountain by a man named June. June was soon after killed by others of the gang, and was found dead near a spring partially covered up with leaves and brush.

This gang had places of rendezvous and secretion on the highest cliffs of the mountains, from which the view was distant in all directions.

Part II.—Source of Title to Land in Orange County.

It is a historical fact that on the discovery of this continent by the nations of Europe, the discovery was considered to have given to the government by whose subjects or authority it was made a title to the country, and the sole right of acquiring the soil from the natives as against all other European powers. And although the right of discovery was never recognized before as perfecting a title to a country, unless followed by occupation or the intention to take possession be declared and made known to the world, the European nations at the time of the discovery of America *assumed* the ultimate dominion to be in themselves, and claimed the exclusive right to grant a title to the soil, subject only to the Indian right of occupancy.

The rights of the British government, within the limits of the British colonies, passed to the United States by the force and effect of the act of Independence, and though the absolute rights asserted by the crown and the colonial governments was incompatible with the rights of the Indians, yet the latter were obliged to yield to the combined influence which military and intellectual power gave to the claim of the former.

It has been judicially declared that the right given by European discovery was the *exclusive right to purchase*, but this right was not founded on a denial of the right of the Indian possessor to sell. Though the right to the soil was claimed to be in the European governments, as a necessary consequence of the right of discovery and assumption of territorial jurisdiction, yet that right was only deemed such in reference to the whites; and in respect to the Indians, it was always understood to amount only to the exclusive right of purchasing such lands as the natives were willing to sell. The royal grants and charters asserted a title to the country against Europeans only. The crown of England never attempted to interfere with the national affairs and rights of the Indians further than to keep out the agents of foreign powers, who might seduce them into foreign alliance. The English crown considered them as nations under her protection, and the United States did the same, and no more. (See 5 Peters, 1; 6 do, 515.)

The first act beyond that of mere discovery affecting the title of lands in New York was probably done by James I., who divided the country into two parts, one called the south and the other the north colony of Virginia. He authorized "Sir Thomas Gates, Sir George Summers, Richard Hakluyt, and their associates, to settle any part of the former, and vested them with a right of property to the land extending along the coast fifty miles on each side of their habitation and reaching into the country one hundred miles." Similar disposition was made of the northern district "to sundry knights, gentlemen and merchants of Bristol, Plymouth and other parts in the west of England."

The charter of Charles I. to those who settled at Plymouth was similar to those granted the Virginia companies. They were incorporated a body politic, with rights to the territory, &c.

In 1664 Charles II. made a grant to his brother, the Duke of York and Albany, which included all of New England, "beginning at the river St. Croix, extending to the rivers Connecticut and Hudson, together with the said river called Hudson's river, and all the lands from the west side of Connecticut river to the east side of Delaware bay."

The country having been taken possession of by the British, Nichols assumed the government, with the title of "Deputy Governor, under his Royal Highness the Duke of York, of all his territories in America;" and as such Deputy Governor, he and his successors in office granted "letters patent" for lands in the said territory; and after the accession of the Duke of York to the crown, the governors, as the representatives of the crown, exercised the same powers.

Some of the patents issued were of a most extravagant character. The one of Captain John Evans, commander of his majesty's ship Richmond, was of this description. It commenced on the Hudson river at the south line of the Pultz, and went westwardly to the Shawangunk mountains; thence southerly to the southwest corner of the present town of Mount Hope; thence it proceeded easterly to the Hudson river; thence to the place of beginning, including the southern tier of towns of Ulster county, two-thirds of Orange, and part of the town of Haverstraw, in Rockland. This patent was canceled in 1698 for the reason above assigned.

The Wawayunda patent was granted fifth of March, 1703, in the reign of Queen Anne, with the consent of twelve Indian chiefs, named Rapinquonick, Wawastawaw, Moghopuck, Comelawaw, Nanawit, Ariwimack, Rumbout, Clauss, Chauckhass, Chingapaw, Quliapaw, and Ohasquemonus. The grant was made to John Bridges, Hendrick Tenyck, Derrick Vandeburgh, John Chotwell, Christopher Denn, Luncaster Symms, Daniel Herran, Philip Rokeley, John Meredith, Benjamin Aske; Peter Matthews, and Christian Christianse. When the grant was surveyed it was found to contain 150,000 acres.*

The German patent, containing 2,190 acres was granted in 1719. The John Johnson patent for 2,000 acres in 1720. The Cadwallader Colden patent in 1724. The Francis Harrison or Germantown patent for 5,000 acres, in 1722. Archibald Kennedy, for 2,000 acres, and Thomas Nuxous for 2,000 acres, in 1723. The Henry Wileman patent for 3,000 acres was granted in 1709. William Bull 500 acre patent, 1724. Arient Schuyler 1,000 acres, and Thomas Swartwout and others 1,200 acres, in 1697. Bull and Gerard patents for 2,600 acres, in 1723. The Cheescocks† patent was granted in 1707. The Roger Mopperson patent of 1,000 acres, and the Rip Van Dam patent for 3,000 acres, in 1712. The Queensbury patent in 1735. The Sacket and Hazard patent for 2,440 acres, in 1727. The Cornelius Low & Co., for 3,000, in 1724. The Patrick McKnight for 2,000, and the McIntosh patent for 2,000, in 1725. The Evertson and Stringham for 3,050, in 1720. Patent to Mary Ingolsby for 4,000 acres at and around the mouth of the Murderer's creek, in 1720.

There were other patents granted during our colonial existence, and after independence the State sold and conveyed such lands as were found to be vacant and not covered by colonial grants.

The colonial grants made before the revolutionary war were declared valid by the State constitution.

The patentees either settled upon their grants, or sold out to others who came and settled thereon, as for instance the proprietors of the Wawayunda patent sold out to Daniel Cromline; John Merritt and Elias Bandinott to Derick Vanderburgh, William Merritt, Adriance Hooglandt and John Van Horn.

The German patent, being divided into nine lots, were sold to several individuals, who afterwards conveyed to others, and they subdivided their lots until some of them became mere village lots, while others remained as farms or pasture lots.

Part III.—Geology of the County of Orange.

Probably no county in the State presents more interesting geological features than Orange. The rocks of the highlands are granite, gneiss and sienite, with veins of trap. The central portions of the county are occupied with strata of the Hamilton shales, Helderberg limestones and grit,

* This patent was bounded east by the Highlands, north by the line of Orange and Ulster county, west by Minisink hills, and south by New Jersey.

† Bounded west by Wawayunda, north by Capt. Evans and Dr. Bridges, etc., south by patents of Daniel Honan and Michael Handon, and east by the Christian patented lands of Haverstraw and the Hudson river.

Medina sandstone, and the gray sandstones, all extending from the northeast to the southwest, from the east foot of the Shawangunk mountains. The rocks which compose the Shawangunk mountains are the shales and the sandstones of the Chemung group.

In order to fully understand the geological features of Orange county it is necessary to compare it with the geology of the State.

The New York system embraces all the rocks from the coal formation to the Taconic system, including the devonian, the silurian, and the cumbrian systems. The name "New York system," is given because the rocks are better developed in New York, and are so situated that their superposition and mineral and fossil characters can be more easily studied than elsewhere.

The New York transition system admits of five divisions, named after the particular region in which they are found. We name them in their ascending order.

I.—The Champlain Division.—Under this division are contained:

1. Potsdam sandstone. Hudson River group.
2. Calciferous sandstone.
3. Chazy limestone.
4. Bird's eye limestone.
5. Isle Lamotte marble.
6. Trenton limestone.
7. Utica slate.
8. Lorraine shales, Oneida conglomerate or Shawangunk grit.

II.—The Ontario Division, divided as follows:

1. Medina sandstone.
2. Green shales, embracing oolitic iron ore, grits coarse and fine, Shawangunk grit or conglomerate.
3. Limestone filled with *pentamerus oblongus*.
4. Niagara limestone.
5. Red shale.
6. Green calcareous shale, with bed of limestone with cavities.

III.—The Helderberg Division, comprising:

1. Manlius water limes and shales.
2. Pentamerus limestone.
3. Shaly limestone.
4. Encrinal limestone.
5. Oriskany sandstone.
6. Caudi-galli grit.
7. Schoharie grit.
8. Onondaga limestone.

IV.—Erie Division, as follows:

1. Marcellus shales, terminating in hydraulic limestone.
2. Shales and grits of the Hamilton group.
3. Shales and grits of the Chemung and Portage groups.

V.—The old Red Sandstone, or Catskill group, which consists of coarse and fine grits of various shades, conglomerates of various degrees of coarseness and of different colors, slaty fissile sandstones, with slates and shales of various colors.

The red shales and grits of the Cattskill group are seen at the falls of the Shinglekill in the town of Deerpark.

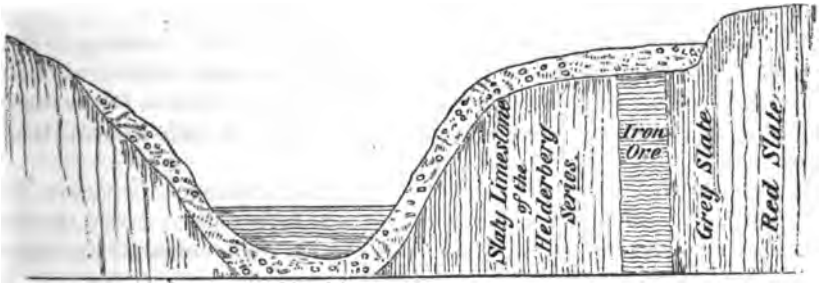
The Erie division forms the base and part of the mass of the Cattskill mountains. They are found from the Delaware river, along the west side of the Mamakating hollow towards Kingston.

Section across the Shawangunk mountains to Port Jervis. A, Shawangunk grit; B, red grit and slate; C, D, ark slate; E, limestone (Helderberg); F, quarternary; G, dark shales and grits, nearly Trappean.

Some of the rocks of the Erie division, near Port Jervis, on the Delaware, are upturned at a high angle; also towards Cuddebackville and Ellenville. Here the rocks of this division are more indurated, and seem almost trappean. In passing southeast we are continually descending the geological series quite to the primary rocks of the Pochuck mountains.

The Helderberg Division extends through Orange county, on the Mamakating valley, by Cuddebackville to Carpenter's point, on the Delaware. The limestones of this division are all upturned, often at a very high angle, in the town of Deerpark, where they form a range of low mountains, rising from the level of the Neversink to half the elevation of the Shawangunk. The rising and subsiding of the tops of this ridge add greatly to the picturesque beauties of this region of the county.

A limestone, containing fossils of this division, is also found in the town of Cornwall, between the village of Canterbury and Salisbury Mills. Its position is between the slate and grit rock. Its dip is to the southeast; and mixed in between the layers of this rock is the *hematite ore* of the Townsend farm.



The Ontario Division.—The Shawangunk grit of this division extends on the top of the Shawangunk mountains from New Jersey to near Kingston. The thickness of these grits vary from sixty to one hundred and fifty feet. These grits have been used for millstones, known as "Esopus millstones."

In several localities of the Shawangunk grits are found veins of lead. Beds of lead ore have been opened at Edenville, Redbridge, and Wurtsboro, also in the town of Deerpark. Zinc ore has also been found in the Shawangunk mine, exceeding in quantity the lead.

A pyritous grit, in the form of boulders, is scattered over the county,

southeast of the Shawangunk mountains. Rocks similar in character to the Shawangunk grit, and the interstratified and overlaying red rocks, extend from the Jersey line on the west side of Long pond northeast to Canterbury, in Cornwall. They are also found at Pine hill. The whole extent of this range of red and grit rock, from New Jersey to Cornwall, is in a highly inclined position—often vertical. The same red rock is found in the town of Blooming Grove, on the southeast side of Round hill. This hill *is primitive*, and here the grit rock inclines against it and rests upon it. The grit rock is regularly stratified, and dips to the southeast; is of all colors from white to red. It extends from Round hill, four miles, to Woodcock mountain. It is also found in the southeast base of Schunnemunk, interstratified with graywacke and slate; also at Pine hill. Here the rock is red, and can be quarried in blocks suitable for building.

The Bellvale mountains, in Warwick, on the southeast side, are composed of graywacke; so also the Schunnemunk in Blooming Grove, the Goosepond mountain and the Sugarloaf mate.

Fine quarries of blue and red stone abound in Schunnemunk and Pine hill.

THE CHAMPLAIN DIVISION.—In this division is the "Hudson river series—slate group"—which consists of slates, shales, grits, limestones, breccias, and conglomerates—sometimes designated as *graywacke slate, graywacke shale, graywacke,* and *slaty graywacke.* They contain facoids and *testacia,* of which a few are seen at the falls of the Wallkill, near Walden, and at Sugarloaf.

The Hudson river group of rocks occupy a large extent of the surface of Orange county. Its general direction is northeast and southwest. Its dip is uniform to the southeast, in some places 30 degrees, in some nearly vertical. It extends from the Hudson river through Warwick to the Jersey line, and on the west side of the Wallkill, from New Jersey to Ulster county; and in all this range there is no rock resting upon it.

It forms the bank of the Hudson river from Cornwall landing to four miles above Newburgh, and it is always seen stratified with graywacke and graywacke slate. In this form it is found at Walden, below Montgomery, in Mount Hope, at Unionville, at Newburgh, and towards Hampton.

In the town of Warwick, near the Jersey line, it forms a *cuneiform* termination, the limestone surrounding it on both sides. From this the argillite widens into an elevated ridge of rich land, called Long Ridge, which extends into Goshen. It forms the surface rock of the most of Goshen, Blooming Grove, parts of Cornwall, New Windsor, Newburgh, Montgomery, Hamptonburgh, Crawford, Wallkill, and in Mount Hope and Minisink, quite to the top of the Shawangunk mountains.

The *Utica slate* is found on the banks of the Hudson above Newburgh. It is of dark color, and in some places black, and highly *carbonaceous.*

The *Trenton limestone* is found near Mount Lookout; also in the town of Hamptonburgh it is found full of the fossil shells of the very early periods of animal life. It is called the "Neelytown limestone" in the neighborhood.

Black river limestone is found a few miles from Goshen, Mount Lookout

being entirely composed of it. It is also found on Big Island, in the drowned lands, also on Pochuck neck and in Minisink, west of the drowned lands.

A *blue limestone*, sometimes *sparry* and *chequered*, commences on the bank of the Hudson at Hampton; it is about one mile in width northwest and southeast, and passes southwesterly through Newburgh into the town of New Windsor, where it disappears in the vicinity of Little pond. The elevated point of this rock at Hampton is in the vicinity of the Dunskamer. It is also found east of Salisbury Mills, in Cornwall, and is visible through Blooming Grove and Warwick to the State line; also in the north part of Monroe, north of Greenwood furnace, and extends southwest to near the Long pond; also in Cornwall, near Ketcham's mill. Also in Goshen it is seen two and a half miles southwest of the village, and extends from the Wallkill southeast to Thompson's pond. The western edge of this bed underlays the drowned lands, and passes along the northwestern margin of the *white limestone* of Warwick; here it divides into two branches on each side of the primitive rock, and passes into New Jersey. This limestone also interlocks with the argillite ridges, as at near Goshen, half a mile southeast from Mapes' tavern, and at the lime kiln of Mr. Thompson.

The limestone of the county is particularly fine for building, and the lime made from it is deemed very superior.

Limestone of the *oolitic* character is found on Big Island, near New Milford, and on Pochuck neck. That found at the latter place, in some of the perpendicular cliffs, the edges are exposed in layers one above the other. Some are of the usual character, others are oolitic, but the round granules are bluish-white quartz, others slaty, approaching the calciferous state, some of a ribbon-like appearance, light and dark gray alternating in the layer.

Below the New York transition system lie the "Taconic system," consisting of slates, limestones, and granular quartz rocks.

Slate rocks of this system are found four miles north of Newburgh, near a small hill of granite rock. The limestone between the Highlands and Goose pond mountain, in Monroe, and also about Bellvale, in Warwick, belong to this system.

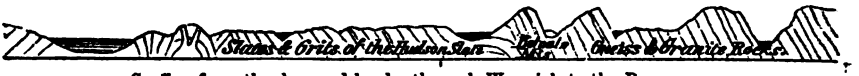
Metamorphic rocks consist of limestones that are granular, dolomitized, and stratified, color white, blue and red; of slates that are talcose, argillaceous, micaceous, and hornblende slate; and of sandstones that are changed to granular quartz rocks, eurite and gneiss.

In Orange county all the changes from the gray and blue limestone are traced into the perfect crystallized limestone, containing the various crystallized minerals, which give them the *metamorphic character.*

There is a *white limestone* of this variety ranging from Mounts Adam and Eve, in the town of Warwick, to Andover, in New Jersey. It is developed in a succession of narrow ridges of only a few rods in width, and is separated by masses of other rocks, of granite, sienite, and granular quartz. Hornblende rock and augite are scattered all around.

This *white limestone* is rarely stratified, and in some places runs into the blue and gray limestone, which is fossiliferous in some instances and oolitic in others. The white limestone forms the shore of the drowned lands at

Amity. In some localities it is snow white, translucent, and compact, like Parian marble. Plumbago and mica are found in it, and also a great variety of minerals. Northeast of the Amity church, on a small knoll, are found calcareous spar, rhomb spar, yellow brucite, xanthite, talc, black and ruby spinelle, cocolite. About one mile southwest of Amity is *specular iron*



Section from the drowned lands, through Warwick to the Ramapo.

ore and serpentine; also veins of scapolite are found southwest of this place, and about a mile north of Amity the limestone is filled with brucite of various colors, magnetic oxide of iron, hornblende, and serpentine.

At the south base of Mount Eve, in an old mine hole, fine crystals of green and brown hornblende are found. At another place is a vein of *arsenical iron.*

The same kind of limestone is found near Fort Montgomery, in the Highlands (through the gorge through which the creek passes into the Hudson), at or near the Forest of Dean; thence it is traced by way of Little Round pond towards Greenwood furnace, and across the Ramapo. It is also seen southwest of Queensbury furnace, in a limited extent. These beds also contain the minerals above named.

ORES.

Two and a half miles west of the village of Canterbury is a *hematite mine,* on the land of Mr. Townsend. The ore has been used in large quantities, and it makes excellent iron. It lies between limestone and grit rock. This bed is traced into Monroe to the beds of magnetic oxide, a distance of near ten miles.

Two beds of *arsenical iron* are found in Warwick; one in a vein near Mount Adam, and the other on the land of Mr. Hopkins, near Edenville. This latter contains *arsenical pyrites* of a white silver color, in connection with arsenic, sulphur, and iron; also red oxide of iron. This vein is connected with the white limestone.

An ore of *titanium* is also found in Warwick, associated with augite and scapolite; also an ore of *cerium* occurs near Fort Montgomery, in Cornwall.

Crystallized serpentine is found at Warwick in the white limestone—*scapolite* at Amity. Also *blende* of minute, red, brilliant prisms, with adamantine luster. *Yellow garnet* is found at Edenville.

The *primary rocks* of Orange county consist of gneiss and hornblende gneiss, granite, sienite, limestone, hornblende, serpentine, augite, and trappean rocks. Among these primary rocks there are no continuous ridges of mountains of more than a few miles in length, in consequence of the interruptions caused by dislocations and lateral heaves of masses of the strata. Ridge succeeds ridge, each of which run out and diminishes in height, until it disappears below the rocks of a more recent origin.

The primitive rocks of Orange county extend from Butter hill to Fort Montgomery, thence along the line of the county to New Jersey, thence to Pochuck mountain, about one mile southeast of the Wallkill.

It embraces a large part of the towns of Warwick, Monroe, Cornwall;

parts of New Windsor, Newburgh, Blooming Grove, and the south corner of Goshen.

Granite is found at the foot of Butter hill suitable for quarrying. *Sienite* at West Point, on the east side of Bare mountain, and at the base of Butter hill.

Gneiss abounds in all the Highlands, has been quarried at the Butter hill, Crow's Nest, at West Point, Buttermilk Falls, and between that and Fort Montgomery.

Mica slate, or *micaceous gneiss*, is found one mile north of Fort Montgomery, and at the foot of the Crow's Nest.

Augite rock is found between West Point and Round pond; also in Monroe, south of Cedar pond, near the Greenwood furnace; near Slaughter's pond, Green pond, Mumbasha pond; near the O'Neil mine, Forshee mine, Clove mine, Rich mine, and on the road to Forest of Dean mine.

Greenstone—Greenstone trap is found near Duck Cedar pond, in Monroe, also about three-quarters of a mile southwest of West Point *granular greenstone* is found at the Crow's Nest, and at Butter hill; also at Fort Putnam.

Hornblende rock is found in large strata in the Highlands; also in the mountain southeast of the Long pond.

Quartz rock is found in every hill and mountain of the Highlands. In the town of Monroe is a large bed of it four rods wide, and rises fifteen feet above the gneiss on each side.

Serpentine is found at the O'Neil and Forshee mines—a large vein in Warwick, on the east side of Long pond.

The rocks of the unstratified and primitive series form the great body of Woodcock mountain, Round hill, Pedler hill, in Blooming Grove, of Goose pond, Sugar-loaf, and Sugar-loaf mate, Brimstone hill, Snake hill, Mount Adam, Mount Eve, Pochuck.

This latter mountain is the most westerly of the primitive mountains in the county; and four miles north of Newburgh is a primitive rock in a hill, which is the most northern; and half a mile northwest of the village of Washingtonville is a small primitive elevation, rising scarcely above the margin of the limestone. This is on the farm of Joseph Moffatt.

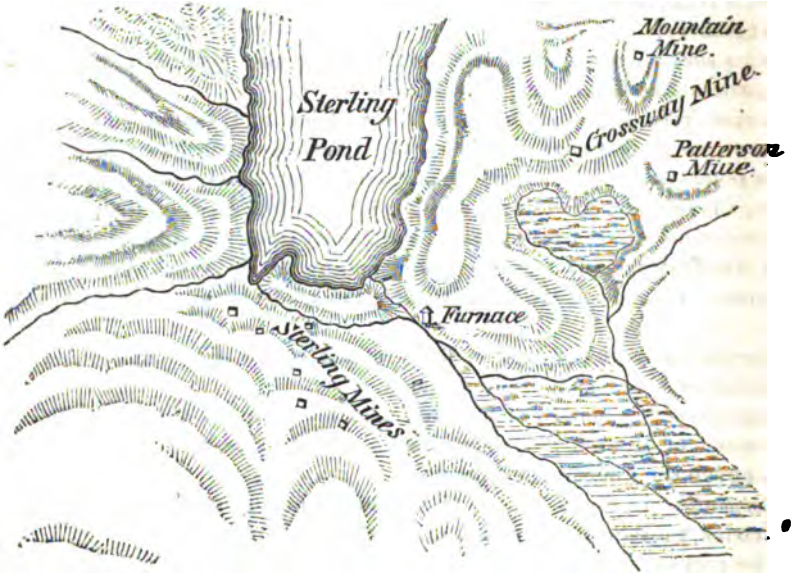
The primitive rocks of the Highlands in Orange county abound in ore of the *magnetic oxide of iron*. The *granitic gneiss* more generally abound in it, and it exists in layers having the lines and bearing of the rock. At West Point the ore is associated with hornblende. It is also found at Meek's mine, at Kronkite's mine (on the farm of Richard Kronkite, southwest of West Point), Round Pond mine, near Round pond, the Forest of Dean mine, the Greenwood mine, Long mine (which was opened in 1761 by David Jones), Patterson mine (half a mile southwest of Long mine), Mountain mine, and a group of mines around it, and Crossway mine southwest of these; all abound in this ore, of rich quality.

The Sterling mine was discovered in 1780, and was put in operation the next year. The ore of this mine is very sound and strong, and has been much used for cannon. This mine covers a surface of about thirty acres; part of the ore is bare, and part slightly covered with soil and rocks.

One and a half miles southwest of the Sterling mines is the Belcher mine,

supposed to be a prolongation of the Sterling mine. Three miles south of Long mine is the Red mine, or Spruce Swamp mine, the ores of which are magnetic and full of pyrites.

Between the Crow's Nest and Butter hill is the Smith mine, the ore of which is native magnet. Also near the foot of Butter hill are indications of ore in place and of value.



Sketch of the Sterling mines and vicinity.

About a mile south of the village of Monroe is the Clove mine, the ore of which is magnetic, granular and compact. A part of the ore of this mine is soft, in a black powder, and can be taken out with a shovel. A species of soap stone is found here. Southeast of the Clove mine is the "O'Neil mine," in the midst of granitic gneiss and sienite. This mine abounds with a great variety of beautiful minerals, among which are crystallized magnetic ore of great brilliancy and beauty, magnetic pyrites, copper pyrites, carbonate of copper, serpentine, amianthus, asbestus, brown spar, rhombic spar, augite, cocolite, feldspar and mica.

A, Patterson mine; B, Mountain mine; C, Crosway mine.

Half a mile southwest of this is the Forshee mine, permeating the whole hill upon which it is located. In this mine is found beautiful red garnet, brown tremoline, cocolite and umber. Large sheets of mica are found southwest of this. About five miles southeast of Monroe is the "*Rich iron mine,*" strongly magnetic and rich, and the deposit of ore abundant. Magnetic pyrites is found in this mine; also mica and hornblende.

Aside from the above, a bed of *titaniferous iron ore* is located on the east side of Bear hill; magnetic ore at the lower landing at Fort Montgomery,

mixed with the sulphuret of iron; also at the place called *Queensbury ore bed*, within a mile or two of Queensbury furnace.

THE DIP OF THE ROCKS in Orange county is as follows:

The slate and the limestone north of Newburgh, N. E., 30° to 45°.

Barnegat limestone, N. E. and N. W., 10° to 20°.

Slates and grits east of the Wallkill, E. and S. E., 20° to 80°.

Slates and grits west of the Wallkill, W. and S. W., nearly vertical.

Gneiss of the Highlands, N. to E., 45°.

Gneiss and other rocks on the west side of Butter hill, S. E., 45° to vertical.

Hudson slate between Highlands and Shawangunk, E. and S. E., 30° to 50°.

Grits and graywacke, N. E. of Bellvale, Sugar-loaf and Goose pond, E., S. E.

Newburgh limestone, S. E., 30° to 60°.

Limestone of the Champlain division at Thompson's limekiln, S. E., 3° to 10°.

Limestone at Mount Lookout, Great Island, &c., N. W., slight.

Conglomerates, slates, &c., S. E. part of Round hill, S. E., almost vertical.

Gneiss between Fort Montgomery and West Point, E., S. E., 60° to 70°.

Gneiss and granite below Fort Montgomery, N., N. E., 40° to 50°.

Of the *breaks* and *derangement* of the strata of rocks in Orange county, many of them are apparent, as at Fort Montgomery, across the clove near Monroe, the outlet of the drowned lands, Mount Hope gap in the Shawangunk, and at the falls of the Mongaap. Also above Newburgh, and on the high points of the Shawangunk mountains, where breaks show themselves, as at High point, Sam's point, Buntico point, Great Mogunk, &c.

Some of these breaks effect the course of the streams and a change of soil. In some instances quite abruptly, and in others by gradual gradation, as we shall explain when speaking of the physiology and soils of the county.

Sketch of the Highlands, from West Point to Snake hill.

SOILS.

The soils of Orange county vary with the geological features of the different sections of the county. The district known as the primary, in most of its higher elevations, is not susceptible of cultivation, owing to the rough and broken state of the surface and the naked character of the rocks. At the base of the Highlands are out-cropping hills; the surface, though broken, is productive, and in many instances presents beautiful farms.

In the district designated by the *Hudson system of slates and limestones*, though irregular and broken, its slatey or shaly beds and sandstone and limestone rocks furnish a soil favorable to the growth of grain and grass. Above the Highlands this district diverges from the river to the southwest quite into the State of New Jersey. No part thereof rises into mountains, yet there are steep bluffs, but not higher than three hundred feet. This is

as important an agricultural district as the county presents. West of this lies the belt of land to the Shawangunk mountains, stretching the whole breadth of the county from Crawford to the Jersey line, in which the soil partakes of the grits and shales of that series, giving peculiar features and qualities to the surface. These are seen prominently throughout the Comfort hills and along the eastern slope of the Shawangunk.

In speaking of the soil derived from a group of rocks, we must necessarily observe the nature of the masses. Many of the shales disintegrate rapidly by the action of water and frost; others require the action of frost for a long period to complete their reduction. The limestones will not only disintegrate but will dissolve by the action of water, which carries the particles into the soil and add to its constituents. Granite and gneiss will also disintegrate and decompose. Upon the high peaks where frosts abound their decay is hastened, and furnish to the slopes and valleys below soils of their peculiar characteristics. The silicious limestones are liable to decay. In many masses the lime is dissolved, leaving the grains of sand to fall off and pass into the soil.

Soils are formed through the effects of water in dissolving the rocks. The materials thus dissolved and held in chemical solution are deposited gradually, and form deposits which impart to the soil its peculiar properties. Soils are made also mechanically by abrasion and from atmospheric influences, by which particles are separated from rocks and pass into the soil.

The distribution of soils is effected by the action of water. It transports soils from one place to another. All running water carries along with its current sediment and particles held in solution. The coarser portion is soon deposited; the finer is carried farther forward, and the extremely fine particles are carried along until they pass into still water, where they gradually settle. In this way bars of gravel, sand, clay and mud or silt are formed. Transportation from the mountains, hills and uplands is thus carried on to the lower during rains and showers, and by means of this the mountains and hills lose, while the valleys gain. The former become thinner in soil, the latter thicker and fertile.

This power of water to transport soils and materials from the parent rock is an ordinary and a daily operation. It is through this agency that the soils have been distributed over the country. Not only have the soils been thus moved and distributed, but also loose rocks, even large boulders, by "*diluvial action.*"

The evidence of this action is found in the existence of large masses of rock (boulders) throughout the county, the origin of which can be referred only to distant places. *Hypersthene rock* is found in the Cattskill series, in Orange county, while that particular rock is found nowhere to exist *in situ* short of Essex county. From this is reasonably inferred that the rock was transported by some agency from its parent bed to the places where found.

The surface of rocks have been found scratched or grooved, as by the passage of hard substances over them, which is to be attributed to diluvial action, as in some cases boulders are found occupying the grave it had made, like a plow left in its furrow, the furrow or grave extending to the boulder and no farther.

In the examination of soils it is seen that the softer rocks have been

made to contribute more largely than the harder ones. The harder rocks resist not only the mechanical action of water and frost, but also that of diluvial action.

In the classification of soils it is noticed that where the gravel and drift beds contain limestone, wheat can be successfully cultivated, as also the other cereals, and where the deposit is clay, and shale, and grit, the grasses grow luxuriantly.

Soils are classified not so much after their productive qualities as by their constituents—the classification being founded on the predominance of certain elements, as where silex predominates the soil is *sandy*, where clay predominates it is called *argillaceous*, and a mixture of the two with organic matter is called *loam*, and clay loam or sandy loam, as clay or silex predominates.

Other conditions, aside from the composition, often determine the character and adaptation to produce, as height, surface, and depth. In a high mountain region the soil is often thin and broken, and unsuitable for the plow, but better adapted to grazing. Level rolling surface presents quite a depth of soil, is generally smooth and arable, and better adapted for grain and general cultivation. The height of the soil affects its temperature, which is a sure test of its capacity to produce. Not only height but moisture combine to determine the temperature of the soil. Indeed, the *principal* modification of the temperature of the soil is water. Wet lands are cold. The evaporation of standing water absorbs the caloric, and the adjacent soil is reduced in temperature. It has been noticed by observation that, during a long rain, the soil would sink in temperature six degrees, while the air would rise in temperature four degrees. In the spring, the earth being wet, it takes a long time for its temperature to rise; the soil acquires heat rather slowly, particularly if wet; the dry warms up more rapidly; but after the soil has become heated by the warmth of summer and early autumn, it often retains its temperature after the air has become cold. On one occasion the soil remained at 50° when the air was reduced to 20°

The drift deposits of Orange county are found lying upon the rocks of all the formations that are consolidated, and in some places are mixed up with the debris and fragments of the rocks that have been separated from the main mass. There are many instances of this on the west shore of Newburgh bay, below the village of Newburgh, where the drift bed, containing boulders and pebbles that are scratched, overlies the abraded rocks, and is itself overlaid by clay beds of the quarternary; and just below Newburgh the drift deposits are of pebbles, coarse and fine, clay and fine and coarse sand in regular layers, to a great depth; and in another place south of the Quassaic creek, the deposit on the slate rock of the Hudson river group is first a deposit of drift boulders, pebbles, gravel, and clay; above this blue clay, covered with gray clay; and above the whole sand and gravel. The height of these deposits is altogether about one hundred feet.*

* The smoothed and scratched rocks of slate and gray grits are found on the banks of the Hudson between Cornwall and Newburgh, overlaid by scratched pebbles of slate and limestone, intermixed with boulders of gray grit, and primitive rocks, and this latter overlaid by the clay and sand beds of the *quarternary*. Also at West Point, gneiss and granite rocks are ground off and rubbed smooth; also near Washingtonville, gray grits, smoothed and scratched in same manner.

The whole plateau adjoining the Hudson river presents a soil gravelly, sandy, clayey—a mixture forming a warm and fertile loam. The surface of this soil is diversified—thrown up into knolls, hills, and valleys, some of them oblong, others round and abrupt. Some of the hills run north and south, others are broken by winding ravines and valleys. The surface rises gradually to Orange lake; thence the descent is to the Wallkill.

About a mile back from the river commence the limestone ridges, which give change to the soil, making it more broken, stony, and shaly, which though not so easily cultivated, is strong and productive. The change westward is to a succession of ridges that are clayey and extremely stony. This district passes from Pine hill north to the county line, and is in width from one to three miles. The soil is better adapted to grass than grain, though some very good crops of corn and rye are produced. The surface throughout is hilly, the intervals being made up of meadow, peat, and bog swamps of some extent. In some places are deposits of sand, gravel, and fine alluvium, of limited extent. Towards the south and southwest this district of soil widens to five or six miles to the north of Murderer's creek; and south of that stream, towards Ketcham's mills, the soil is of the debris and deposits from the surrounding mountains; extremely fertile, but extremely broken and rocky. To the extreme north the soil is determined by King's hill, which borders upon the west by the valley of the Wallkill.

The valley of the Wallkill extends from the drowned lands in New Jersey through the county to the line of Ulster and to the Hudson river. Through Orange county the soil is peculiarly rich and fertile. The surface is generally level, or slightly rolling, affording fine arable and meadow land. The soil throughout is warm and productive; probably no section of the State presents a greater variety of soils; all as equally rich and fertile. In the town of Montgomery much of it is rich alluvium, intermixed with clay, sand, and gravel. In Wallkill the soil is more diversified; in some places it is clayey, of no great depth above the rock, in others gravelly, and again sandy and elevated. Through Goshen and Warwick it partakes more of clay, clay and sand loam, with slight intervals of gravel. As we approximate the State line, the primitive formations of Mount Adam, Mount Eve, and Pochuck mountain change the constituents, but do not detract from its fertility. Some of the most rich and productive soils of the county are found in the islands of the drowned lands.

West of the valley of the Wallkill the soils are affected in their constituents by the Shawangunk range of mountains; they become more hard, broken, and mountainous. The soil generally *a clayey loam*, well adapted for grazing. It is through this district of the county that the famed "Goshen butter" is produced. The grasses of this section are very sweet and nourishing, the water is pure, and the climate healthy. In some parts the soil becomes slaty and warm, as in the vicinity of "Iogee hill," in others it is shaly, and covered with fragments of rocks, as is found throughout the eastern slope of the Shawangunk, yet fertile and productive in grass.

In the town of Deerpark, in the valley of the Neversink, is a range of soil, from the Delaware to the Sullivan county line, being the alluvium brought down from the adjacent hills and upper country, that is very fertile.

It is of easy cultivation, and though it has been under the plow at least two centuries, it still ranges with the most productive lands in the State. The balance of the town is upon the slope of the mountain; being rough and broken, is useful for pasturage and fuel.

In the town of Blooming Grove the land is smooth, undulating, in some places broken by ridges of rocks, but extremely fertile and productive. It is generally clayey loam, gravelly, running into gravel and clay loam. Adjoining the ridges of slate rock it becomes a slaty loam. Probably no town in the county is, in the aggregate, more productive, or the general improvement in tillage and agriculture more rapid and permanent. This will also apply to Chester and the east division of Goshen.

The south part of Blooming Grove and Chester is broken by the mountain range, into bold, craggy, and elevated peaks, through which are *cloves*, and intervals of fertile lands. These cloves and intervals interlock each other and pass into Cornwall and Monroe, forming the principal cultivated lands of those towns. The principal of these are Blagg's and Smith's clove, Sugar-loaf valley, and the valley of the Ramapo.

Upon the top of Butter hill, on the road from Canterbury to West Point, in a depression of the mountain, lies an area of fertile soil, as in a basin, being the deposits from the surrounding elevations. Here was located the "king of the highlands," perched amid the cliffs and rocks, Mr. Kronkite, breathing the Alpine air, and living independent of all the citizens of the country below.* From Mr. Kronkite's the road is gradually descending and winding to the public grounds at West Point.

Peat and shell marl abound in many parts of the county. The former is much more abundant. It is found in most swampy places where the grass and aquatic plants and mosses have decayed. From these a fibrous peat is formed which is light and spongy. Decayed trees also form peat, which is known as *ligneous peat.* Many of these peat deposits are overgrown with bushes and trees, others are covered with moss and vines. There are beds of peat in Orange county that can be shaken under the foot like a mass of jelly. The best peat lies three or four feet below the surface. These deposits are valuable to the agriculturalist. About seventeen thousand acres of peat deposit is found in the drowned lands on the Wallkill, five hundred acres in Chester and Blooming Grove, the principal deposit being at the *Gray Court meadows.* It is found also in Minisink, Monroe, Cornwall, Montgomery, Mount Hope, and Crawford. In New Windsor north of the little pond northeast of the Little Britain church. In Hamptonburgh at the Tamarack swamp, and in Purgatory swamp.

We also notice about ten acres near Townsend's ore bed in Cornwall; several deposits near Fort Montgomery; also near Fort Putnam; west of the Round pond; near Patterson's mine; Crossway mine, and about fifty acres east of the Sterling iron mines.

*In 1823 Mr. Kronkite, when digging a pit to bury potatoes for the winter, found the ground sinking beneath him several feet, exposing a cavern extending from thirty to forty feet in various directions. Its roof was studded with minute brilliant crystals of spinelle, augite, hornblende, phosphate of lime, brucite and mica. The surrounding rock was white and flesh colored limestone, highly crystalline. Another cave southwest of this is called the *bear hole.* About a mile and a quarter south of West Point, on the farm of Mrs. Kinsley, is a spring containing carbonate of iron in solution, and is strongly chalybeate.

Some of these peat and bog meadows are formed by bars of rock across their outlets, as is the case with the drowned lands, and of others that are of limited extent.

Below Fort Montgomery is a marsh which extends about two and a half miles. This, owing to the tides of the Hudson, partakes of the character of salt marshes.

In some of the peat deposits the material runs to a great depth, demonstrating that originally they constituted lakes and ponds. The Gray Court meadows are of this description. These are surrounded by hills, as the hills around a lake, and the peat has never been fathomed to their bottom in many places. Through it runs the Cromline creek, which no doubt has been the agent, to a great extent, in bringing alluvium to fill in the waters of the lake. This, together with the decay of vegetable matter, has formed the meadows as they now exist.

A similar deposit is found north of the little pond in New Windsor, which no doubt was once filled with water, presenting a pond or lake similar to the other.

And also, in the same town, east of the old camp ground, and of the lands of Mr. Tompkins, a deposit is now found which at some former period must have been a lake. The depositing process being gradual, as the decay of plants, and the debris of the surrounding hills furnished the material; these filling in, encroaching upon, have gradually displaced the water, and furnished soil upon which now grow valuable agricultural productions.*

Part IV.—Physiology of Orange County.

The general features of the county are pleasant and beautifully diversified. They range from the rugged, broken, precipitous ridges of mountains to the deep valley, from high hills to the winding intervals, and from a rolling, undulating surface to the level plane, presenting all the gradations from prairie monotony to Alpine cliffs and elevations.

The general range of the Highlands is from northeast to southwest, with spurs of separate ridges more west and east. Many of these terminate in Warwick and Monroe. A prominent feature of these Highlands is the absence of long, continuous ridges. They are all broken up into short, abrupt elevations of from 800 to 1,600 feet. The southern terminations of these are very abrupt—many of them perpendicular, naked cliffs, as if broken off, while the northern terminations are gradual, and slope gently to their base. This is particularly seen of the Sugar-loaf mountain—less so of the Butter hill and Woodcock.

* The bones of the mastodon, and of the fossil elephant have been found in the peat bogs and marshes of Orange county. In 1794 they were found five miles west of the village of Montgomery. In 1800 they were found seven miles northeast of the same place. In 1803 on the farm formerly owned by Dr. Charles Fowler. In 1844 found near Scotchtown, in Wallkill. In 1815 found in a low meadow on the farm of Richard Goldsmith, deceased. In 1845 on the farm of N. Brewster, in Coldenham. These latter were of large dimensions, and the animal must have been thirty-three feet in length, and of great age. They were found in a peat formation, and six feet beneath the surface. The peat formation was in a circular basin, surrounded by slate ridges, and descending, was composed as follows, viz: The surface, peat two feet, red moss one foot, shell marl three feet, mud fourteen feet.

It is peculiar of the Highlands that they are composed of a great number of short parallel axes, as in *echelon* with regard to each other, and giving the general direction of the aggregate elevations. Many of these are prolonged, so as to produce other elevations, which greatly diversify the features of these mountains.

The Shawangunk mountains are less broken. These mountains continue, with but slight breaks, from near Carpenter's point to the Sullivan and Ulster counties' line. The eastern slope of the mountain is singularly uniform, and adapted to cultivation to the top, but the western presents wrinkles or subordinate axes of elevation, which terminate in rocky points, and greatly break up and diversify the features of the country.

Between the Shawangunk mountains and the Wallkill are subordinate ranges of hills, of greater or less altitude, toward Montgomery to the Comfort hills, which are a high range running north and south, breaking up and diversifying the country west of the Wallkill.

As to the Highlands, in their whole length, their wild scenery accords with their striking legends. They were the stronghold of our country in the revolutionary struggle. They were the fortress of our liberties. Their rocky points, their mountain heights, their deep ravines are associated with stirring events. There is hardly a spot which does not bear the marks of invading assaults, or of the entrenched defences of our armies. The Shawangunk range have been tinged with blood—have wilder and older traditions of savage contests. It is here that fierce battles, relentless war and bloody massacre have startled the echoes of its beautiful scenes, and disturbed their wonted quiet and repose.

The interior of the county is marked as a rolling upland, broken in many places by abrupt and isolated hills and the valleys of streams. At the base of the Shawangunk flows to the north the kill of the same name, washing out a narrow, crooked valley through the grits and shales of the adjacent hills. The Wallkill widens out on either side a vale of singular beauty and fertility from the southern borders to the northern limits, as its waters flow smoothly and gently over rocks and pebbles to the northeast. At Walden its banks are studded with evergreens, and its sides are *walled* in by the ever-enduring rocks, between which the waters lash and foam down a fall of forty feet, throwing up a spray in which the sunbeam is gilded and garnished with all the hues of the rainbow. Here, harnessed to wheels and gearing, the waters perform Titan labors for the prosperity of man.

To the east of this vale, and almost upon the same level, is that of the Otter kill, which for miles runs parallel, or rather in approximation, when suddenly it turns to the east, and through a winding course amid the hills debouches into the Hudson above the Highlands. Throughout this valley the hills approach and retire in singular fantasy, affording wide alluvial flats, and pent-up gorges, gradual slopes, and steep declivities, hither and hither. At Salisbury Mills the scenery changes to that more wild and picturesque. Here the waters rush through a gorge of rocks and hasten with noisy speed, through broken, rocky bed, down to the Hudson. The waters so tranquil and tardy in their upper channels, assume in the lower some aspects of a mountain torrent before mingling with tide water.

A tributary of the Otter kill rising far in the east of Warwick, amid the mountains and rocks of the primitive formation, scoops out a tortuous valley for its course until it reaches Gray Court meadows. Here more sluggish and tranquil, it gathers strength and hastens thence around, between the hills, to its junction. This Cromline creek and valley present throughout scenes wild and beautiful, a surface varied from plain to mountain, a soil and country from rich to poor, from smooth to broken and precipitous.

The cloves between the mountain ranges are full of beauty. These reach from north to south full many miles of different breadths, on either side surrounded by mountain heights and precipices, from whence a thousand streams and rills of water enlarge the stream that passes through. From Slaughter, Duck-Cedar, Round and Mumbasha ponds, and from innumerable springs, are gathered the waters of the Ramapo, which, driving forges, mills and factories, passes beyond southern bounds.

Tortuous valleys from Long and Poplopen's ponds, converging to the south from Black-top mountain and Cat's hollow, give character to *Forest of Dean*, far depressed beneath Bear hill and the Torn. Where from the south the Two pond valley intersects at Lamareux's and thence diverges to the northeast, passing by ruined forges to the river. This succession of vales is full of Alpine beauties, where mountain cliffs and jagged rocks fill every foreground; abrupt declivities and broken valleys make up the picture.

It is here in olden times, as told by legend, *the pirate Kidd* did land and secrete his stolen booty, and that beneath the rocky banks on either side were buried piles of wealth. Here have many diggers toiled and toiled to lay it bare, but toiled in vain. Just so, as miles below did speculators toil with steam and coffer dam to reach the ship in which Kidd sailed, and thus possess its golden freight.

To the south of Sugar-loaf mountain streams and valleys pass to Wickham's pond, in the valley expanded wide called Sugar-loaf. From this it runs a devious course to the village of Warwick, with hills and mountains, vales and headlands intersecting, turning its course now south, now west, then north of west, in zigzag form, each rod of which is a picture deserving study, in which the artist might go to school and learn of nature in her most varied works, and where the farmer might stop to contemplate the hidden treasures of the soil, and draw them forth by culture, so rich this vale, so beautiful its parts. From Warwick south and west it turns, still zigzag in its course, until it passes from the State. Throughout this vale are seen the farms that range in tilth and value not second, the farmers sturdy and substantial, a pleasing scene, not always found in other parts as here in Wawayunda.

Far through the hills and mountains of the Highlands, and to the south of Black Rock hill—a bold and dizzy peak where eagles congregate—is seen a mountain lake. Its waters placid, deep, in a secluded glen, where winds and squalls pass far aloft, so low it lies beneath their swoop. From thence to West Grove a vale extends as rocks and hills permit. On either side are seen the mountain peaks, both far and near, and through the highest of them all this vale meanders, and the waters of the lake doth

leap and babble from rock to rock to "Eagle valley," where formerly did dwell alone the "king of birds," but now is seen the home of man far in these mountain cliffs. This vale from thence descends abrupt from rock to rock and cliff to cliff, in crooked course, down to a lower lake, and thence down to the Hudson river. 'Tis here the waters run and foam o'er rocks, like *buttermilk*, and name the place. He who would study nature in her grandest phase should visit here. A week, a month, would be too short a time to learn in full detail the subjects here presented. 'Tis here that earth and air and water—that mountain heights and valleys low—that broken rocks and quiet glens—that forest glades and babbling waters—each separate or all combined, impart conceptions of the beautiful. 'Tis not a casual scene gives impress of the sublime, for all around are seen the objects producing that emotion.

Utilitarian views have here been busy. The idle waters have been curbed and led and taught to work where once they ran at pleasure. Knowing no law but that of nature, they now obey the rule of man. Like the wild Indians amid the laboring pale faces, their liberty departs, and every sense of independence is merged into the ways and means of *earning money*.

The Highlands of the Hudson, through which the river gorge is excavated far down among their great foundations, stand bold and prominent in all their massive grandeur. From the north, they break upon the sight at the Dunskamer, the Fishkill and the Newburgh hills intervening. The waters of the river spread out, and Poplopen's rocky cliffs floating on the distant surface. To the right stands Butter hill, emerging, like Atlas, to Alpine heights, and capped with fog. Just opposite lies Antony's Nose, with profile features most strongly drawn in rock and cliff. As the observer passes near they seem to lift their heads to greater height, and just when opposite, the walls of rock rise separate; their tops are hid amid the clouds, and glens and hills run through them all with intricate confusion. Far to the west is seen the *Crow's Nest*, the highest peak, with ragged pines and cedars torn by many a blast, and jagged rocks piled up in Titan order. Just south of this the walls of old "Fort Put" are seen, like some old *feudal stronghold* where knighted barons did lord it, and defy the world, but this was built to guard the rights of man against the assaults of titled foes. Still further south the hills retire, leaving a high plateau between West Point and Fort Montgomery, and here a mountain gorge divides the range through which the Poplopen flows; and south of which Bear's hill is seen to tower aloft, a fitting balance to the opposing Dunderberg. From thence to south and west are peaks and ranges of the Black mountains, and towards the Ramapo the Greenwood range, amid whose rocks is Cedar pond, reflecting trees and cliffs as in a mirror. From thence a mountain stream is seen to pass through glen and vale to seek the river, and many a ruined forge is seen along its course, where once the sons of Vulcan did smelt the ore and hammer bars of iron.

In the southern part of the county lie the Warwick mountains, which divide themselves into separate and isolated ranges. On the east lies the *Rough mountain*, whose sides are rough and jagged with broken and projecting rocks, from which it takes its name, and further east are the Sterling mountains, with mines of ore, wooded and rocky peaks of different

heights. To the west of Long House creek are the Taylor mountains, Round hill and Rocky hill, the two latter named from their appearance. Also the Pochuck mountain, named after an Indian chief who lived near by, in olden times, and east of the Sugar-loaf valley, the Bellvale mountains separating the valley from Trout brook, the source and head of the Cromline creek.

East of the drowned lands are Mount Adam and Mount Eve, conjoined, as were our first parents; the former much the highest, the latter much the longest. A riddle, this! The latter is farthest east. Each spring up from the bottom lands and the rolling glades of the surrounding country, and rise far above the *white crystalline valley* of this section of country. These mountains are highly picturesque in all their phases, and full of interest to the man of science; are grouped most beautifully, and abound in mineral wealth.

'Tis said, in former times, that rattlesnakes abounded amid its rocky crevices, and sportsmen fond of killing would number scores per day, but now but few of them appear, and these are far between.

Mount Lookout, in Goshen, is of moderate height, and the principal elevation in that town. Its bed is limestone, and furnishes building materials, but the lime made therefrom is inferior.

Sugar-loaf mountain, in the town of Chester, when seen from the north resembles *a sugar-loaf*, and hence the name. Its northern ascent is quite gradual, its southern broken and precipitous. This mountain and its adjacent hills divide the waters of the Wawayunda from those of the Cromline creek, and is the apex from whence the country descends to the north and to the south. It is therefore a very prominent object for a great distance on either side. Its height is several hundred feet above the surrounding lands. In the vicinity of this mountain was an Indian burying ground of about thirty graves, heaped up like small haystacks, and surrounded by palisades of high stakes. These were the graves of the Indian chiefs and warriors, a fit receptacle for the heroic dead. To the northeast of Sugar-loaf is the Goose Pond mountains, a range of moderate height and extent, of an oblong shape, with wooded slopes, and full of sylvan beauties. To the east of this is *Lazy hill*, whose slopes and ascents, though gradual, impart a sense of weary laziness to those who pass over it. It is of no particular feature except to fill up the scene and to perfect the landscape.

To the north of this are the *Tom rocks*, an abrupt elevation in the south part of Blooming Grove, which to the passer-by seem to be more rocky than mountainous. They lie lengthwise from north to south, and rise in two separate peaks to an elevation of about two hundred feet above the surrounding country. To the north of these is *Pedler hill*, named from the fact that a pedler was robbed and murdered in its vicinity in olden times. It lies west of Satterly's mills, and rises more than one hundred feet above the general elevation. To the northeast of this is *Rainer's hill*, lying lengthwise northeast and southwest, of about the same elevation of Pedler hill, and northeast of this is *Mosquito hill*, jagged and high, and further northeast *Round hill*, shaped like an inverted bowl, and seen far from the north towards the Ulster county line. This hill is one of the prominent

landmarks of the county, being the first and most prominent that rises in the southeast part of the valley south of Washingtonville.

On the east of this valley rises the range of hills named Woodcock, which form the first range of elevated mountains towards the Highlands, and extend north and east to the Tobias farm, south of Salisbury Mills. Mining operations have from time to time been attempted in the north part of this hill, but without success. Its mass is composed of quartz and quartz gneiss, with slight veins of plumbago and pyrites, but do not develop any of the richer ores.

Pea hill, and north of it Pine hill, in the north part of the town of Cornwall, are abrupt eminences rising out of a broken and stony district of country—the debris probably of these two hills. From thence northeast the surface is elevated and stony to Snake hill, which is the north termination of these mountain peaks towards Newburgh, and which, to the Ulster line, is succeeded by ledges and ridges of limestone rocks.

SWAMPS, &C.

In the town of Newburgh, north of the Orange lake, lies the Big swamp, stretching from the Ulster county line to the lake, and through which the Bushfield creek runs This was no doubt, in former times, an extension of the lake to the north, as well as the swamp south of its present borders, which when all under water would add three times to its present length. It would require but a slight excavation to pass the waters of this lake and vicinity through the Beaver Dam creek into the Otter kill at Salisbury Mills, but the outlet is by way of Chambers' or Quassaic creek to the Hudson river.

In the northwest part of the town of New Windsor is Great swamp, passing far towards Coldenham, through which runs the Tin brook, to the west of which the land rises into a *rough ridge*, and known by that name.

In Chester are the Gray Court meadows, of which we have made mention, now cultivated and fertile, but formerly a swamp or lake. Southwest of these are the Black meadows, which extend south and west to Demarest's, and through which runs the Black Meadow creek. These two meadows extend quite across the town of Chester and into Warwick, affording much rich soil and a bountiful supply of peat and marl.

In the south part of the town of Warwick is Long swamp, lying to the southwest of Edenville, which is drained towards the south into New Jersey.

Of the drowned lands we have made reference; they extend from the outlet in Goshen into New Jersey, and into which the Pochuck mountains and Pochuck neck intrude from the south. These drowned lands are full of islands of great fertility; some of them of considerable area. Their names are Pine, Great, Gardner, Merritt's, Black Walnut, Cranberry, Fox and Seward. An extension of these drowned lands towards the east is in the Quaker Creek swamp to near Florida, through which passes the stream of that name.

The Tamarack swamp in Hamptonburgh has been described, and Purgatory swamp, named by the late Peter Bull, from data known to himself.

It is a species of Dismal swamp, of considerable extent, through which runs a small sluggish stream.

Grassy swamp is in the town of Deerpark, and extends from Sullivan county towards the Mongaap. It is a low, wet swamp, overgrown with long, coarse grass.

East of Hopewell, in the town of Crawford, and towards the *Paughcaughnaughsink kill*, lies a swamp of considerable extent, surrounded by the Crawford neighborhood of fine grazing farms, which lies in the angle formed by the junction of the above named kill with the Shawangunk kill; and northwest of the Sinsebaugh neighborhood, in the same town, lies another swamp, through the northwestern part of which the Bullville and the Pinebush turnpike road passes, and southeast of Searsburgh is a swamp of considerable extent, the waters of which are drained by a small stream which runs north past Carniker's to the Dwaar's kill.

LAKES AND PONDS.

Reference has already been made to the Orange lake in the town of Newburgh, which has changed its name quite as often as some men do *their politics*. It was first known as *Mouse pond*, and then *Machen's pond*, after Capt. Machen, who was the first to open its outlet and to erect a *mint for the coinage of coppers to circulate as change during the war of the revolution*. It was afterwards called *Big pond*, and under that name was known for years as a favorite fishing ground to all the people in the vicinity. It was changed from this to Orange lake, by which name it is now known, and is the sporting ground for many *fashionables* who never knew it or approached it during the period of its more humble names. It covers some 400 acres of land, and is quite deep in some places. It is fed by strong springs and creeks that pass into it. By the construction of the outlet, it can be drained down about twelve feet, and forms a valuable reservoir to furnish water for the mills below. During the most severe droughts its head of water has never been exhausted.

Big pond, in the town of Deerpark, is the largest in the town. It is about one mile long and a half a mile wide. The outlet runs towards the west, and furnishes power to drive Van Etten's mill, (it is here called the Shingle kill,) and passing south, enters the Delaware near Honesville. It is situated on lots 35 and 36 in the first division of the Minisink patent.

Little pond, southeast of the above, is about one-quarter of a mile in diameter. Its outlet passes south to Cuddeback's grist mill, and forms the *Old Dam brook*, a tributary of the Neversink.

Long pond lies partly in the town of Warwick and partly in New Jersey. It is about nine miles long and one wide. It is used as a feeder for the Morris canal. Its waters abound in fish, and are much frequented by the sporting gentry. Upon a peninsula at its north end is the boarding house and hotel of T. Felter, erected and opened for the accommodation of guests who visit the pond. This too has been changed in name, and is now known as the Greenwood lake.

Wickham's pond lies in Sugar-loaf valley, north of Greenwood lake. It covers an area of about eighty-five acres, and abounds in fine fish. The outlet comprises some of the head waters of Wawayunda creek.

Thompson's pond covers an area of about one hundred acres. It lies in the north part of the town of Warwick, not far east of Florida. Its outlet furnishes power for a grist and saw mill. This pond furnishes fine fish.

Sterling pond lies in the southeast part of Warwick. It covers an area of about sixty acres. The outlet is at the southern termination, and passes into New Jersey. Here, more than one hundred years ago, the manufacture of iron was commenced, and has been continued to the present time. The manufacture of iron here is quite extensive, embracing furnaces, forges, bloomeries, an anchor shop, and furnace to make steel. The surrounding mountains furnish ore of the best and most profitable variety.

Duck-Cedar pond is in the south part of Monroe. It is two miles long, north and south. It is so near on a level with the Sterling pond that its waters can easily be made to flow into its outlet, but naturally the outlet flows north to the Ramapo.

Mambasha pond lies in the western part of Monroe. It is from one and a half to two miles in diameter, and contains two or three islands. It is noted for its fine fish, particularly pickerel. Its waters are pure and cool, being fed by mountain springs. Its outlet passes to the northeast, and thence to the south past the Southfield works, furnishing water power for mills and forges. It enters the Ramapo near the works of Hudson McFarland, and is known by the name of Mambasha's creek.

Little Long pond is in the extreme west part of Monroe. It is about one mile long and a quarter of a mile wide. It abounds in fine fish. Its outlet runs to the north and west, and furnishes a part of the head waters of Cromline creek. *Round Island pond*, named from a round island in it, lies north of the latter, is about a quarter of a mile wide and somewhat longer. Its outlet passes north and east to the McKnight pond near Monroe village, and thence south and east to the Ramapo, at Seamansville.

Hazard's pond is in the north part of the town of Monroe, is about half a mile in diameter. Its outlet furnishes power to the Highland mills, and runs thence north through the Woodbury clove and Ketchumtown into Murderer's creek. This pond is a beautiful sheet of water, surrounded by mountain ridges and Alpine scenery. It furnishes some very fine fish.

In the eastern part of Monroe is *Slaughter pond*, about one mile long and half a mile wide. It lies nestled amid the mountains, and is fed by springs of pure, cool water. Its outlet, as *Slaughter brook*, passes south and west, abounding in trout and other fish, to the Ramapo at Wilkes'. There is scarcely a sportsman in all these parts who cannot tell you of the beautiful trout taken from this brook, and of the pleasures incident to their relish. Just stop at Wilkes', and, armed with line and rod, try it. There are in the mountain districts of Monroe the Cedar pond and the two ponds, the Bull pond and Poplopen's pond, of which we have given a description.

In the south part of the town of Cornwall is Long pond, Round pond, and Cranberry pond, forming the water sources of the *Poplopen's creek*,* which passes through *the Forest of Dean*, and enters the Hudson at Fort

*The stream that runs from Bull to Poplopen's pond passes under a natural bridge, the breadth of which is fifty feet, and its length up and down the stream seventy-five or eighty feet. It is used as a bridge, and one might pass over it without being aware of it, unless he hears the noise of the water underneath.

Montgomery. East of the Ant hills, in the town of Cornwall, is the *Sutherland pond*, about half a mile long, the outlet of which runs south and west into the Schunnemunk creek near I. Seaman's. The trout fishing up this outlet is very fine.

Little pond, in the north part of the town of New Windsor, is a beautiful sheet of pure water. Its outlet, for some distance, is subterranean, and was formerly quite a favorite sporting ground for the gentlemen of Newburgh and New Windsor. The Newburgh water works bring its waters to that place to supply the village with the pure article, of which it furnishes an abundant volume.

RIVERS AND CREEKS.

Of the Hudson river, which forms the eastern boundary of the county, it is needless to write. Upon it the Atlantic tide is borne a hundred miles beyond the Highlands, floating ships of war, and vessels deeply laden with the commerce of the north and west. Along its eastern banks are iron tracks, upon which swift engines draw long trains of cars at the foot of rude cliffs, or through tunnels that pierce their granite buttresses. It was called the "River of the Mountains" before Sir Hendrick sailed up it, and from that event received its present name. Upon the western borders of the county runs for a short distance the *Delaware*, which by some of the Indians was called the Cookquago. It is said by tradition that in olden times the waters of the Delaware were dammed back by the Water Gap mountains, and that the country for nearly forty miles was covered by a lake, the waters of which, breaking down the mountain barriers, passed away, leaving the country dry, and thence the name of *Minsies*, which is the derivative of Minisink, the name of all that country in Orange bordering on the Delaware.

In the extreme western bounds of the county, and as a dividing line with Sullivan, is the Mongaap river, called in 1779 *Mangawping*, and sometimes "*Ming-wing.*" It rises west of Monticello, in Sullivan county, and passes south to the Delaware. This river has been confounded by some writers with that of the Delaware in name.

The *Bashe's kill* is named from an Indian woman who lived upon it at a place called Westbrookville, in Sullivan county. This stream is about seventy feet wide, and empties into the Neversink.

Ouwe-dam kill, sometimes called *Fall brook*, is called *Old dam* from the circumstance of a mill and dam having been erected upon it, and caused the waters to overflow a large tract of low land. It falls into the Neversink, and about half a mile above it falls over six hundred feet in the course of a mile, and is hence called *Fall brook*.

Neversink. The extreme head waters of this river are in Ulster county and the north part of Sullivan. It runs south and southeast into the town of Deerpark to near Cuddebackville, and thence turns south and southwest until it joins the Delaware near Carpenter's point. The Delaware and Hudson canal passes along its western bank up the Mamakating valley, and crosses it a short distance from Cuddebackville. The Neversink is about two hundred feet wide. It is a never-failing stream, from which circumstance its name. Some years ago a Mr. Van Tuyl, who lived upon

the river and owned considerable property near by, obtained an appropriation from the State of ten thousand dollars to improve the navigation of its waters. He went to work knocking off projecting rocks, clearing out logs and rubbish from the Neversink bridge down to the Delaware, and when done floated a raft to seek the waters below. It passed a few miles down in safety, but striking some sunken rocks, was whirled suddenly around and broken to pieces, putting the raftsmen in jeopardy of their lives. This was the beginning and the termination of the navigation of the Neversink. The State's appropriation aided a few persons who were not used to seeing much money, but did not improve the waters in those parts. By means of the Delaware and Hudson canal a thoroughfare is now opened to the Hudson, and the New York and Erie railroad brings Port Jervis within three hours of the seaboard.

Grassy Swamp brook rises in Sullivan county, and unites with the Mongaap in the southwest part of the town of Deerpark. Its head waters are in a low meadow, and its course southwest through the mountain ridges to the Mongaap.

The *Wallkill* rises near Deckertown in New Jersey, passes through the *drowned lands* into Orange county, forming the dividing line between Warwick and Minisink, Goshen and Wawayunda, Hamptonburgh and Wallkill, passes through the town of Montgomery into Ulster county, and thence to the Hudson river at Rondout. Its course is northeast, and the plane of elevation upon which it passes being from Sussex county in New Jersey, descending gradually to near Esopus in Ulster. It is a durable stream, and furnishes the inhabitants with extensive hydraulic power throughout its course. Its current is not rapid, except at Walden, where it passes over a fall of about forty feet, giving power to drive any amount of machinery. The principal locations of hydraulic power of the Wallkill are at New Hampton, Phillips' Mill, Phillipsburgh, Montgomery and at Walden. At the latter place are factories and grist and saw mills.

Rudger's kill, from Rutkys, the name of an Indian. Its extreme western head is in the town of Greenville, near the residence of J. Woods; from thence it runs northeast to Ketcham's mill, on the south line of Mount Hope; thence south and soutwest to Centreville and Millsburgh; there it turns east for about two miles, and thence south until it enters the Wallkill in the edge of the drowned lands. A northern head water of this kill is in the town of Wallkill.

Shawangunk kill rises in the town of Greenville, passes through Mount Hope, and upon the line between Orange and Ulster, running a northeast course to the Wallkill, in the town of Shawangunk. Its plane of declension is to the northeast, while that of the Neversink, upon the other side of the mountain, is to the southwest. *Little Shawangunk* kill rises in the southwest corner of Wallkill and runs north to the Shawangunk kill, below Horton's saw mill.

McCarlin's kill rises in the south part of the town of Crawford and runs south to the Wallkill, about one mile above the Stony Ford bridge.

Dwaas kill has its rise in the town of Wallkill, and runs northeast through the town of Crawford, and enters the Wallkill in the town of Shawangunk. It is quite an important stream to the citizens of Crawford,

affording quite extensive water power at Searsburgh and other places. There are two streams in the western part of Crawford that run north and enter the Shawangunk kill. They are called the "Big Pekonasink" and "Little Pekonasink." The name is Indian, and gives name to an old patent for lands in Ulster county, issued in 1694, as well as to these two streams. The word is sometimes spelled "Peakadasank."

Tin brook rises in the town of New Windsor, south of Coldenham, runs north into Montgomery and into the Wallkill below Walden. It furnishes considerable water power in its course, which is as zigzag and as fussy as can well be imagined.

Muddy kill flows from the eastern slope of the Comfort hills and runs south to the Wallkill, above Montgomery.

Quassaic creek.—This is also called *Chambers' creek*, from a patent of *Chambers* for 1,000 acres, located south of the German patent and south of the mouth of the creek. The name is derived from *Quassuck-ick*, Stony creek, from the rocky and stony bottom over which it runs. It receives its headwaters from Bushfield, Fostertown and Gidney creeks. Its main *reservoir* is the Orange lake. It runs a southeastern course into the Hudson a mile below Newburgh. In its course it furnishes hydraulic power for some twenty different mills, factories and other works.

At the mouth of the creek is a beautiful vale extending up about half a mile, and in its center a beautiful artificial pond, which furnishes water for several factories. On each side of the vale the banks rise 100 feet, festooned with evergreens, shrubs and trees. It is a beautiful place, and the resort of many who come here to spend a leisure hour for recreation and for pleasure.

Otter kill rises in the north part of Chester, and passes through the east division of Goshen into Hamptonburgh. At Lagrange it runs upon nearly the same level with the Wallkill, and here a tributary of the Otter kill, in high water passes some of its waters into the Wallkill. The two streams, here, are within a mile of each other. Through Hamptonburgh it runs around the base of the hills in the form of a half circle into Blooming Grove, and through that town in a serpentine course through Washingtonville to Salisbury Mills. Here, meeting the mountain ledges, it passes over a fall, into a deep chasm which it follows through rocks and crags into the Murderer's creek. About a mile below Decker's the *Cromline creek* enters Otter kill. The *Goldsmith creek* rises in the lands of Robert Burnett, Esq., in Little Britain, runs south through the *old Clinton place*, into the Otter kill at Washingtonville. The *Colemantown creek* enters it a mile above, and the *Beaver Dam creek* near Salisbury Mills. The valley of the Otter kill and tributaries furnish some of the most fertile lands and productive farms in the county. After receiving the waters of the Schunnemunk creek from the south it is known as the *Murderer's creek*, by which name it has been known since 1694, from the circumstance that shortly before that a family named Stacey lived near its mouth, and were murdered by the Indians. The mouth of this creek at the Hudson forms the division line between New Windsor and Cornwall, and of the old east and west line, the former division line between Orange and Ulster.

The *Beaver dam* is a small stream rising in Montgomery, and passes into

the Otter kill at Campbell's hall. Its whole course is through low meadows from near Goodwill church to Campbell hall.

Long House creek rises in New Jersey, and runs north until it unites with the outlet of Wickham's pond, and forms the Wawayunda, which runs southwest into New Jersey, and joins the Pochuck creek, which runs north from New Jersey into the Wallkill in the drowned lands.

Quaker creek is formed by the outlet of Thompson's pond. It runs west into the Wallkill. It furnishes power for mills, and is the boundary between Warwick and Goshen.

Ramapo rises in the north part of Monroe, its extreme northwestern head being the Round Island pond, west of Monroe village; from thence it runs east to near Turner's, and thence south, furnishing an unlimited hydraulic power through the town to the Jersey line. It enters the Passaic river near Pompton plains.

The *Poplopel's creek* is formed by the junction of the Queensbury with the Forest of Dean creek, at the ruins of the old Queensbury furnace and forge. It runs thence east to the Hudson river at Fort Montgomery. This is in all its features a mountain stream, having its sources amid the Greenwood and Blackrock mountains. From lakes and springs, its waters run through deep valleys and broken glens down an *echelon* of rocks to the waters of the Hudson, at a point classic in the history of our country.

Part V.—Political Divisions and Population.

Until the year 1650 no part of Orange county was designated by name or in history. The first trace of the white man within its borders is found at the "*Minisink mine holes*" digging for ore, and toiling to accumulate wealth. The designation of the Minisink country was quite indefinite.

From the Journal of Captain Arent Schuyler, who visited the country in 1693, it would seem that all the country west of the Wallkill to the Delaware was designated as the *Minisink country;* that north of Deerpark and Mount Hope, the country was called the *Shanwans country.*

Previous to the year 1698 a patent was granted to Capt. John Evans of forty miles along the river, and twenty miles in breadth, which included the most of the county of Orange to the Minisink country. This grant was vacated by the Earl of Bellemont in 1699.

In 1719 that section of the country embraced by the German patent was called *Quassaick*, from a tribe of Indians of that name residing on the creek. The Palatines designated their settlement Newburgh, and afterwards all the eastern part of Orange county was known by the general designation of "*the precinct of the Highlands.*"

About the year 1732 New Windsor was known as an indefinite district of country in the precinct of the Highlands.

In 1714 the old town of Goshen was laid out upon the Wawayunda patent, and comprised all the lands included therein under the name of "*the precinct of Goshen.*"

Although Orange county was erected in 1693, it was not entitled to separate franchise and privilege until some years after. In the year 1693 it contained but "twenty families, and was under the care of New York".

city, the officers of the city and county of New York being officers of the county of Orange, and their election made by both counties.

We find in 1698 that the Earl of Bellemont complains to the Board of Trade that the sheriff of New York had been guilty of fraud in the election of representatives, and in his return of votes from Orange county. These sheriffs were spoken of as "men of mean rank and education," but continued in office for certain ulterior motives.

The population of Orange county in 1698 consisted of twenty-nine men, thirty-one women, and 140 children, nineteen negroes, making a total of 219.

The county of Orange then comprised all the territory north of New Jersey, to the old east and west line running west from the mouth of the Murderer's creek to the Delaware.

It was not until the year 1700 that Orange county became entitled to a member of assembly. It is alleged in a paper written about that time, that the Earl of Bellemont granted this privilege to Orange for the purpose of securing a majority of the Assembly favorable to him.

In 1702 we find Lord Cornbury residing at Chear-Hull, in Orange county. This was in Orange town, Rockland county, and in September of the same year Cornbury writes that in taking the census he found the return from Orange county signed by the "*Marke* of *Theunis Talmane, Esq.*, high sheriff of the county of Orange," who, according to the same paper, was a "fellow who did not know how to go about his business," and unworthy of the station. This Theunis Talmane was the first sheriff of Orange county.

In 1703 a section of Orange county is designated under the name of "Wiwanda," known as Wawayunda, which comprised Warwick, part of Minisink, Goshen, and part of Hamptonburgh, south of the old east and west line.

At this time the population of the county was 268, and in 1712 it had increased to 439.

In 1702 a census of the county was taken in full. We give it as a literary curiosity. It is as follows:

Males from 16 to 60.	Over 60.	ffemales, weomen.	Males children.	Females children.	Males negroes.	Females negroes.	Male children.	Female do.
	Wm. Menite...	Margry his wijff.....	....	....	4	1	1	2
Daniel D. Clereque....	.....	Geretji his wijff.....	1	1	1	1	1	1
Jacob D. Clereque.....	.....	.....	....	....	....	....	....	....
Abram Heuringh.....	.....	.....	....	....	....	....	....	....
Thomas Van Howtten..	.....	Trijntje his wijff.....	1	6	....	1	1	....
Roloff Van Howtten....	.....	.....	....	....	....	....	....	....
Claes Van Howtten....	.....	.....	....	....	....	....	....	....
Hendrick Gerritson.....	.....	Mary his wiff.....	3	....	....	....	....	....
John Hendrickssen.....	.....	.....	....	....	....	....	....	....
Harman Hendrickssen..	.....	.....	....	....	....	....	....	....
Geridt Hendrickssen....	.....	.....	....	....	....	....	....	....
Lambert Arienssen.....	.....	Margrit his wiffe.....	2	4	....	....	....	1
Geridt Lambertsen.....	.....	.....	....	....	....	....	....	....
	Reyns Jansen...	Lysbeth his wijffe.....	1	1	....	....	....	1
Lowe Reynerson.....	.....	.....	....	....	....	....	....	....

Males from 16 to 60.	Over 60.	ffeemales, woomen.	Males children.	Females children.	Males negroes.	Females negroes.	Male children.	Female do.
Thonis Taelman		Brechties his wyffe		3				1
		Dirckje a widow			2	1		
Caspar Jansen		May his wyffe	3					
Johan Classen		Trijntje his wyffe		3			1	
Johanus Gerissan		Cathrin his wiffe	6	2				
Jacob Coel		Barbara his wiffe	2	2				
Coenrat Hanssen		Leuntje his wiffe	1	1				
Reijnier Mijnersen		Mary his wiffe		1			1	
Dirk Straat		Tryntje his wiffe	1	1			1	
Cornelis Hearingh		Cathe his wiffe	1	4	1			
Cosyn Hearingh		Mary his wiffe	2	2		1		
Jacob Flierboom		Marij his wiffe		1				
Samuel Conklin		Hanna his wiffe	1	3	1			
Abram Blauvelt		Gritje his wiffe	4	3				
John Waard		Gritje his wiffe		3				
Isaac Gerrissen		Mary his wiffe	1					
Pieter Hearingh		Gritje his wiffe	1	5	1			
Jeremiah Ceniff		Anna his wiffe	3	3				
John D'Puy		Jannette his wiffe	3	3				
John D'Friese		Ariantje his wiffe	2	2				
Gerritt Huijbrechtz								
John Meijer		Antje a wedow	2	3	1			1
Paulus Turekesen								
John Hey		Trijntje a wedow		2				
Melchert Caspersen		Gertruyt his wyffe	2	2				
Jeurian Melgertsen								
John Perre		Sara his wiffe	1	3				
Jemes Weller		Bethe his wiffe	3					
Isaac Brett		Magdalen his wiffe		1				
Will Juell		Sara his wiffe	2	4				
Will Juell James								
	Flaris Crom	Lyne his wiffe	1	2				
Willem Crom		Geritje his wiffe	1					
Arian Crom								
Gysbert Crom								
Albert Mimelay		Meenske his wiffe		5	1		1	
Cornlis Cooper		Altje his wiffe	4	7	1	2		
		Sara Crabb wedow	2	1				
Edward Mek								
	Frans Wey	Indian W. his wijffe						
	Dirk Storm	Mary his wiffe						
Coms to 49 men	Coms to 5 men	Coms to 40 wiffe	57	84	13	7	7	7

In the countij Orange the 16th day of Janij, 1702. This ijs a Trew Acount of all the Males and ffemales of men, women and children. Witness ower Hand.

Pr order of the justices the peas.

WILL MERRETT,
DANIEL DEKLERCK,
Dit is T R het marke van.
THEUNIS ROELOFFSEN VAN HOWTTEN,
CORNELIS CLASSEN,

Justices.

D. STORM, *Ch.*

(Endorsed.) This is a triew acount of the county Orange.

In 1703 the amount of taxes raised in the county was as follows, viz:

The Queen's tax	£22	10	0
Half of clerk's salary	3	10	0
To pay for book	0	6	6
Towards furnishing county jail	2	10	0
Towards pound for cattle	1	10	0
To be levied in all	30	6	6

The first courts for the county were held at Tappantown, the present Orangetown, in Rockland county, in 1702, until 1727, when Goshen was erected into a half shire, and part of the courts were held at that place.

In the records of the court of sessions held at Orangetown in 1705, we find the following judgment: "Upon the presentment of Conradt Hanson, that George Jewell kept a dog which was injurious to many of his neighbors, it was ordered that the said Jewell should hang the said dog."

From the year 1735 all that part of Orange county then in Ulster, north of the old east and west line, was divided into the precinct of New Windsor* and the precinct of Wallkill. In 1772 the precinct of Wallkill was divided by the erection of the precinct of Hanover, which name continued until 1788, when it was changed to Montgomery.

The old town of Goshen comprised all the south part of the county south of the east and west line as far west as the Minisink country, and as far south as Haverstraw. In 1764 the precinct of Goshen was divided by the erection of the precinct of Cornwall, which comprised the present towns of Cornwall, Blooming Grove and Monroe.

All that part of Orange county which is now in Rockland was divided into Haverstraw and Tappan or Orangetown, until 1791, when Clarkstown and New Hempstead were erected into towns from Haverstraw. The latter is now called Ramapo.

After the war of the revolution, in 1788, the following towns were erected in Orange county, viz: Cornwall, Goshen, Minisink, Warwick, Orangetown and Haverstaw—six towns. In 1791, by the erection of Clarkstown and Ramapo, the number was increased to eight towns.

In 1798 the towns of Haverstraw, Orange, Clarkstown and Ramapo were erected into a county named Rockland, and the towns of Newburgh, New Windsor, Wallkill and Montgomery were taken from Ulster and annexed to Orange. Also the town of Deerpark was erected from Mamakating and added to Orange, making in Orange county the following nine towns, viz: Cornwall, Deerpark, Goshen, Minisink, Montgomery, Newburgh, New Windsor, Wallkill and Warwick.

In 1799 Blooming Grove and Monroe were taken from Cornwall.

In 1823 Crawford was taken from Montgomery.

In 1830 Hamptonburgh was taken from Goshen, Blooming Grove, Montgomery, New Windsor and Wallkill.

In 1833 Mount Hope was taken from Wallkill, Minisink and Deerpark.

In 1845 Chester was taken from Goshen, Warwick, Blooming Grove and Monroe.

* *The precinct of New Windsor*, about that time, was described by Francis Harrison, Esq., one of his Majesty's council of the province of New York, as "extending twenty miles from north to south and sixteen miles from east to west," and "as containing many inhabitants, that the chief of them live in good credit and reputation."

In 1849 Wawayunda was taken from Minisink.

In 1853 Greenville was taken from Minisink, making 17 towns in the county, as follows:

1. Blooming Grove,
2. Chester,
3. Cornwall,
4. Crawford,
5. Deerpark,
6. Goshen,
7. Greenville,
8. Hamptonburgh,
9. Montgomery,
10. Monroe,
11. Minisink,
12. Mount Hope,
13. Newburgh,
14. New Windsor,
15. Warwick,
16. Wawayunda,
17. Wallkill.

The population of Orange county at different periods was as follows, viz:

By the census of New York, taken in 1723, 1731, 1737, 1746, 1749, 1756, 1771, the population of Orange county for those years was:

The Year when taken.	Whites.					Negroes and Slaves.					Total.
	Men.	Women.	Male Children.	Female Children.	Total.	Men.	Women.	Male Children.	Female Children.	Total.	
1723.....	309	245	304	239	1,097	45	29	42	31	147	1,244
1731.....	627	537	325	299	1,785	85	47	19	33	184	1,972
1737.....	860	753	501	433	2,547	125	95	38	35	293	2,840
1746.....	536	763	871	721	2,891	181	34	51	44	547	3,268
1749.....	922	899	1,061	992	3,874	111	103	62	84	360	4,234
1756.....	1,162	998	1,213	1,083	4,456	140	94	103	93	430	4,886
1771.....	2,464	2,124	2,651	2,191	9,430	206	174	162	120	662	10,092
1786.....	3,429	3,187	3,382	3,206	13,204	442	416	.....	.....	858	14,062

The State Constitution of 1777 provided for a census of electors, and, according to its provisions, several electoral censuses were taken; from these we copy the following for Orange county:

Year.	Electors owning Freeholds.		Electors not owning Freeholds.
	Worth £100 and over.	Worth from £50 to £100.	Rent tenements 40s. value.
1790.....	941	1,149	584
1795.....	1,392	172	534
1801.....	2,271	115	1,079
1807.....	2,583	123	1,109
1814.....	3,081	152	1,787
1821.....	3,081	135	1,830*

By the State census of 1790, the county of Orange contained 8,119 males, 7,654 females, and 904 slaves; total, 16,677.

In the year 1800, there were in Orange, 1,145 slaves; in 1810, 966; in 1814, 666; in 1820, 1,125; in 1830, none.

The National censuses were taken every ten years, commencing with 1790. The State censuses were taken under the authority of the Constitutions of 1821 and 1846, every ten years, in the years ending in *five*, intermediate between the National censuses.

* And 1,789 who paid taxes and were enrolled in the militia.

Comparative Population of the Towns in Orange County, from 1790 *to* 1860.

Towns:	1790.	1800.	1810.	1814.	1820.	1825.	1830.	1835.	1840.	1845.	1850.	1855.	1860.
Blooming Grove	.....	1,611	1,759	1,622	2,219	2,258	2,099	2,091	2,396	1,969	2,184	2,184	2,248
Chester	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,744	1,641	1,696	1,849
Cornwall	4,225	1,648	1,769	1,830	3,020	3,020	3,489	3,289	3,926	3,854	4,471	4,578	4,800
Crawford	.....	.....	.....	.....	.....	2,018	2,019	2,007	2,075	2,072	1,912	2,000	2,003
Deerpark	.....	955	1,230	1,189	1,310	963	1,167	1,329	1,607	2,012	4,032	5,504	5,986
Goshen	2,448	2,563	3,153	3,054	3,441	3,022	3,361	2,967	2,829	3,222	3,149	3,213	3,480
Greenville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,218	1,198
Hamptonburgh	.....	.....	.....	.....	.....	.....	1,365	1,319	1,379	1,399	1,343	1,303	1,295
Minisink	2,215	3,584	4,005	3,947	5,053	4,710	4,919	4,439	5,093	5,258	4,972	1,295	1,266
Monroe	.....	2,116	2,570	2,686	2,969	3,186	3,671	3,712	3,914	3,935	4,280	4,551	3,975
Montgomery	3,563	4,206	4,710	4,677	5,541	3,712	3,885	4,016	4,100	4,020	3,933	3,792	3,973
Mount Hope	.....	.....	.....	.....	.....	1,457	1,535	1,484	1,565	1,600	1,512	1,735	1,575
Newburgh	2,365	3,259	4,627	5,107	5,812	6,169	6,424	7,033	8,933	9,001	11,415	12,773	15,196
New Windsor	1,819	2,001	2,331	2,175	2,425	2,255	2,310	2,460	2,482	2,174	2,457	2,555	2,452
Wallkill	2,571	3,592	4,213	4,200	4,887	4,328	4,056	3,714	4,268	4,968	4,942	5,415	6,603
Warwick	3,603	3,834	3,978	4,351	4,506	4,635	5,009	4,676	5,113	4,696	4,902	4,987	4,628
Wawayanda	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,009	2,085
Total	22,809	29,368	34,347	34,905	41,213	41,732	45,360	45,096	50,739	52,227	57,146	60,862	63,812

The number of persons entitled to vote in Orange county were in 1825, 7,524; in 1835, 8,873; in 1845, 10,590, and in 1855, 11,301.

The classification, by occupation, of the inhabitants of Orange county is as follows:

Agents, 27; agricultural implement makers, 12; apothecaries and druggists, 29; apprentices, 20; architects, 5; artists, 7; auctioneer, 1; bakers, 40; bankers, 7; bank officers, 9; barbers, 23; barkeepers, 7; basket makers, 17; bell hangers and locksmiths, 2; blacksmiths, 340; block maker, 1; boarding house keepers, 18; boat builders, 12; boatmen and watermen, 149; boiler makers, 16; book binders, 3; booksellers and stationers, 4; boot and shoe makers, 299; box makers, 4; brass worker, 1; brewers and distillers, 29; brick makers, 228; brokers, 2; builders, 6; broom makers, 3; brush makers, 10; butchers, 90; cabinet makers, 69; cadets, 201; carpenters, 665; carmen and draymen, 48; carvers, 7; cement maker, 1; chandlers and soap makers, 22; chemists, 7; civil officers, 18; clerks, 298; clergymen, 102; clock maker, 1; clothiers, 14; cloth manufacturers, 4; coach and wagon makers, 194; collectors, 2; comb makers, 3; confectioners, 10; contractors, 13; cooks, 25; coopers, 78; coppersmiths, 3; cotton manufacturer, 1; cutter, 1; dairymen and milk dealers, 15; dentists, 17; dress makers, 298; coachmen, 33; drovers, 5; dyers and bleachers, 6; editors, 5; engineers, 34; engravers, 5; expressman, 1; fancy operatives, 56; farmers, 5,455; farriers, 2; firemen, 7; fish dealers, 8; fishermen, 14; fish tackle makers, 6; forwarders, 4; fruit dealers, 6; furnacemen, 17; gardeners and florists, 57; gas fitter, etc., 1; gas manufacturer, 1; gate keepers, 9; glass stainer, 1; glovers, 2; gold and silversmiths, 15; grocers, 78; gunsmiths, 5; hardware dealers, 7; hat and cap makers, 23; hotel and inn keepers, 85, hunters, 2; inspector, 1; ivory block makers, 3; jewelers, 8; joiners, 2; keepers of prisons, 2; laborers, 2,695; laundresses, 12; lawyers, 59; lime burners, 17; lithographer, 1; livery stable keepers, 18; lumbermen, 13; machinists, 87; mail agents and carriers, 6; manufacturers, 49; masons, 247, match makers, 5; mechanics, 19; merchants, 308; midwives, 3; millers, 92; milliners, 99; millwrights, 15; miners, 122; morocco dealers, 15; moulders, 27; mould makers, 9; musicians, 35; music teachers, 17; nail makers, 2; nurses, 15;

nurserymen, 5; oil cloth makers, 28; hostlers, 23; overseers and superintendents, 15; painters and glaziers, 109; paper makers, 48; pattern makers, 4; paviors, 2; pearl workers, 2; pedlers, 35; photographers, &c., 15; physicians, 89; piano makers, 16; pilots, 1; plaster figure makers, 3; plumbers, 8; policemen, 4; polishers and burnishers, 8; porters, 9; powder maker, 1; printers, 37; produce dealers, 3; professors, 2; publishers, 2; railroad employees, 225; rope makers, 10; saddle and harness makers, 64; sailors, 20; saloon keepers, 12; sash and blind makers, 18; saw makers, 35; sawyers, 7; sculptor, 1; servants, 2,140; sextons, 9; ship carpenters, 44; shirt and collar makers, 2; soldiers and military officers, 202; speculator, 1; spinners, 30; stone and marble cutters, 42; store keepers, 11; stove makers, 3; students, 87; surgeons, 3; surgical instrument maker, 1; surveyors, 13; tailors, 357; tanners, 47; teachers, 194; teamsters, 119; telegraph operators, 7; tinsmiths, 61; tobacconists, 54; tool makers, 4; toy makers, 2; trimmers, 6; turners, 5; undertakers, 11; upholsterers, 2; varnish makers, 7; watch makers, &c., 15; watchmen, 7; weavers, 77; whalebone worker, 1; wheelwrights, 13; whip makers, 2; wood cutters, 19; wool carders, 11; woolen and worsted workers, 2.

Civil List—County Officers.

JUDGES.

1702. William Merritt,
John Merritt,
1727. Cornelius Harring,
John McEvers,
1733. Vincent Matthews,
1735. James Jackson,
1738. Rum Ransom,
1740. Abraham Harring,
Cornelius Cuyper,
Thomas Gale,
1749. Daniel Denton,
1759. Michael Jackson,
1763. Benjamin Tusten,
1764. John Coe,
1770. John Perry,
1778. John Harring, 1st judge,
Elihu Marvin,
Thomas Cuyper,
John Wheeler,
1782. William Ellison,
1788. W. Thompson, 1st judge,
Jeremiah Clark,
1789. John Suffren,
1792. William Wickham,
John Steward,
1798. Moses Philips,
1802. George Gardiner,
1807. John Barker,
1807. Noah H. White, 1st judge,
1808. Andrew Graham,
Anthony Davis,
Daniel Birdsall,
1809. James Finch, Jr.,
1810. John Bradner,
R. Armstrong,
Jonathan Cooley,
1811. William Boodle,
1812. Isaac Belknap, Jr.,
1814. William A. Clark,
George D. Wickham,
Francis Crawford,
1815. John Blake, Jr.,
Samuel S. Seward, 1st judge
Joseph Morrel,
Alexander Ross,
1818. Stephen Jackson,
1821. William Thompson,
Daniel Tooker,
1823. Solomon Sleight,
David M. Westcott,
1824. John Hallock, Jr.,
1826. Isaac Jennings,
1828. Gilbert O. Fowler,
1830. John B. Booth,
1831. Nat. P. Hill,
1832. H. W. Elliott, 1st judge,

1833. Nathaniel Jones,
1834. Robert Denniston,
Hulet Clark,
1836. James G. Clinton,
1838. Miles Hughes,
1840. Joseph R. Andrews,
James D. Bull,
1841. G. Denniston, 1st judge,
S. W. Fullerton,
1843. Gideon W. Cock,
1844. Frederick A. Hoyt,
1845. John Sutton,
Joseph Slaughter.
1846. A. M. Sherman, 1st judge,
1847. David W. Bate,
1851. John G. Wilkin,
1855. ——— ———,
1859. J. J. Monell.

SURROGATES.

1778. Benjamin Tusten,
1787. James Everett,
1815. Edward Ely,
1823. Wheeler Case,
1827. Daniel H. Tuthill,
1831. John B. Booth.
1840. George M. Grier,
1844. Charles Borland,
1847. Benjamin F. Duryea,
1851. James W. Fowler,
1856. John C. McConnel,
1860. David A. Scott.

SHERIFFS.

1701. Theunis Talmane,
1702. John Perry,
1706. Jeremiah Caniff,
1737. Michael Dunning,
1739. Theodorus Snediker,
1747. Joseph Sackett, Jr.,
1757. Jonathan Lawrence,
1778. Isaac Nicoll,
1781. William W. Thompson,
1785. Hezekiah Howell,
1789. Thomas Waters,
1790. Benjamin Jackson,
1792. Thomas Waters,
1794. Benjamin Jackson,
1797. Thomas Waters,
1801. John Blake, Jr.,
1805. William A. Clark,
1809. Benjamin Strong,
1810. John P. Hurtin,
1811. Benjamin Strong,
1813. Benjamin Sears,
1815. Thomas Lockwood,
1819. Moses D. Burnett,
1821. Nathaniel P. Hill,
1823. Amri M. Ball,
1826. Stacey Beakes,
1829. Joshua Conger,
1832. James Hulse,
1835. Charles Niven,
1838. Edward L. Welling,
1841. David Sease,
1844. Adam H. Sinsabaugh,
1847. Edward L Welling,
1850. John Van Etten, Jr.,
1853. Adam Lilburn,
1856. William H. Hauston,
1859. John Cowdrey,
1862. Benjamin Hanmon.

COUNTY CLERKS.

1702. Derick Storm,
William Huddleston,
1721. Gerhardus Clowes,
Thomas Pullen,
1726. Vincent Matthews,
1763. David Matthews,
1778. Thomas Moffatt,
1799. Reuben Hopkins,
1813. Henry G. Wisner,
1815. David M. Westcott,
1817. James W. Wilkin,
1821. David W. Westcott,
1823. Asa Dunning,
1835. L. L. Vail,
1838. Albert S. Benton,
1841. L. L. Vail,
1844. John C. Wallace,
1847. Albert S. Benton,
1850. Nathan Westcott,
1856. Charles Drake,
1859. David C. Winfield,
1862. David C. Winfield.

Special County Judge—George W. Greene, Goshen.
Special Surrogate—F. A. Hoyt, Goshen.
Deputy County Clerk—C. G. Elliott, Goshen.
Under Sheriff—Calvin Gardner, Goshen.
County Sealer—W. W. Warden, Goshen.

PART VI.—CLIMATE AND PRODUCTS.

The climate of a district of country must, to a great extent, determine its productions. It is not chiefly latitude, nor elevation alone, that determines the climate, but the situation of a country, as its proximity to the ocean or other large bodies of water, its surface, whether level or hilly, and the position and slope of the hills, the nature of the soil, and the extent of cultivation of the surrounding country.

It has been ascertained that the temperature diminishes as we ascend, but that where the slope is gradual the diminution of temperature is less than in abrupt and precipitous peaks. As a current of air moves horizontally over a plain of uniform temperature, no change will take place; but should it pass upward from this plane, it will expand and occupy double the space, being subject to half the pressure, and the amount of heat it contains is diffused through double the space, its intensity or temperature will be diminished in that ratio.

Heat and moisture are essential atmospheric agents not only in the production of vegetable matter, but also in giving character to the climate of a country. Where heat and moisture are not found in sufficient quantities, absolute sterility must prevail, and the relative heat and moisture of different countries is intimately connected with their different *climates*. It is, however, the temperature of the air that determines the amount of moisture it will contain; as for instance, in winter, when the temperature is very low, the quantity of vapor in the air is exceedingly small, and it has been seen that upon high hills a continual precipitation of moisture takes place from clouds overcharged with vapor, while in the valleys below it is retained unprecipitated.

From experiments, it has been ascertained that a temperature at zero the air will retain but 54-100 of a grain of vapor, while the air at 60° above zero will contain 5 75-100 grains of vapor. We give the figures, as they are of great importance in practical meteorology in explaining the *rationale* of climatic variations in different sections of the country: The air at 10° above zero will retain 84-100 grains of vapor; at 20°, 1 30-100 grains; at 30°, 1 97-100 grains; at 40°, 2 86-100 grains; at 50°, 4 8-100 grains; at 60°, 5 75-100 grains; at 70°, 7 99-100 grains; at 80°, 10 94-100 grains; at 90°, 14 81-100 grains; at 100°, 19 79-100 grains of vapor.

The phenomena of the extreme humidity of the atmosphere in warm climates is here explained, as also of the frequent precipitation of moisture from the clouds, in rain, in higher, and consequently colder sections of the country.

Newburgh, in Orange county, is in 41 deg. 30 min. north latitude, elevated 150 feet above tide water; and from observations made for 13 successive years, the mean temperature has been found to be 50 deg. 10 min.

Goshen, situated in latitude 41 deg. 20 min., and elevated 425 feet above tide, observations made for eight years show a mean temperature of 49 deg. 16 min. Difference between Newburgh and Goshen, 94 minutes. From these data, the temparature of different parts of Orange county may be calculated with considerable accuracy.

There are some exceptions, however. In the mountain districts of the Highlands are many cloves and valleys shut in by surrounding peaks where the atmosphere is permeable to heat, and where the interradiation thereof is much greater than in more open and exposed places. The tides of the Hudson river affect the temperature of the adjacent shores inland for some distance. The warm volume of water coming in from the ocean diffuses a warm vapor over either shore, which keeps back the frosts of autumn and cuts short those of spring, when vegetation is often injured or cut down in the interior of the county, and when winter is *almost* present upon the Shawangunk slope.

The mean temperature at Newburgh, as ascertained from an observation of thirteen years, was as follows, viz: For January 33 deg. 76 min.; for February, 24 deg. 20 min.; for March, 35 deg. 24 min.; for April, 48 deg. 86 min.; for May, 55 deg. 77 min.; for June, 72 deg. 70 min.; for July, 73 deg. 88 min.; for August, 69 deg. 09 min.; for September, 63 deg. 14 min.; for October, 54 deg. 54 min.; for November, 37 deg. 02 min.; for December, 29 deg. 07 min. Mean temperature for winter, 29 deg. 01 min.; for spring, 46 deg. 62 min.; for summer, 71 deg. 89 min.; for autumn, 51 deg. 57 min.

From the data we have heretofore stated, the mean temperature for Goshen being 94 min. less than at Newburgh, for the year, that for the different seasons are easily ascertained, and may be applied to the whole valley of the Wallkill, the Otterkill and their tributaries.

The Shawangunk range west of the Wallkill is more elevated, and gradually rises to about 1,500 feet above tide water. In the towns of Crawford, Wallkill, Mount Hope, Wawayunda, Minisink and Greenville, to the Shawangunk kill, a range of country is presented in which the temperature is lower than through the central portion of the county. Here the average of temperature would range from *two* to *four* degrees less for the year, and in the same degree for each season. At the top of the Shawangunk mountain, it would range full *five* degrees less than at Newburgh, making some difference in its capacity to produce some of the more tender crops, as also of the number of days between the frosts of spring and those of autumn.

At Newburgh the period between frosts, though variable, has been known to be from May the fifth to September twenty-ninth, 146 days. At Goshen frosts have been noticed as late as the first of June, and as early as the twentieth of September, making a period of 111 days between. West of the Wallkill, throughout the Shawangunk slope, the period is still less, though varied by local causes, to which the slope and configuration of the particular place give rise.

Along the small streams of water where the evaporation is constant and rapid, frosts are more frequent than upon the adjacent elevations, caused by the absorption of caloric from the air and adjacent objects, and sur-

charging the cooled atmosphere with vapor, which is precipitated in frost. The valley of the Shawangunk kill for this reason is far more liable to late and early frosts than many of the hill lands in Crawford, Wallkill and Minisink; and the valley of the Otter kill, than the hills of Chester, Goshen, Hamptonburgh and Blooming Grove.

In some cases where the streams are large and the evaporation is so great as to produce fog which, passing over the adjacent lands, will prevent frost, the precipitation of which will be in rain or dew instead of frost. These fogs are frequent in slopes that descend to low valleys, as in the side of a hill, or the concave surface of the sides of a hollow, where the cool air from above, mingling with the vapor of the valleys, precipitates the vapor into *visible fog*. This is often seen in the valleys which are filled with fog in early morning, and so long as the fog continues frosts will be prevented.

But the same process, though to a different extent, gives rise to frosts in the same localities, and the lower valleys are found to be some degrees cooler than the surrounding hills. We have noticed depressions in a field in which corn or buckwheat was growing, where the frosts cut down the growing crop, leaving the more elevated parts unscathed. For the causes above mentioned the corn crop is not as certain in the Gray Court and Black meadows of Chester, as upon the adjacent hills, and buckwheat would be quite certain to be cut off by the early frosts of autumn. In some places along the Wallkill the liability to frost is far greater than at others, owing partly to the make of the adjacent hills, and to the soil, whether wet or dry, which influences the temperature.

There is another mode of ascertaining the climate of a district of country, and its adaptation to produce, which is by observing the periodical changes of trees and shrubs. The first appearance of the robins, the blooming of various trees and plants, the ripening of strawberries, the commencement of hay and wheat harvest, and the first killing frosts of autumn. The blooming of trees and shrubs generally indicates the commencement of vegetation, the time when seed will germinate, and the first killing frost of autumn the termination of vegetable growth and maturity.

At Newburgh the shadbush (June berry) blooms April 24th, the peach April 23d, the plum May 1st, the cherry April 27th, the apple May 6th. Strawberries ripened June 10th. Haying commenced July 4th. Wheat harvest commenced July 17th. The first killing frost September 29th.

At Goshen the shadbush blooms April 27th, the peach April 28th, the plum May 4th, the cherry April 29th, and the apple May 9th. Haying commenced July 8th, and the wheat harvest July 21st. The first killing frost September 20th.

With but slight variations, the above furnishes data for all of the eastern and middle sections of the county. The western part, being the mountain range of the Shawangunk, the variation will be a few days later in spring and the period of autumn frost some earlier.

The temperature of the season with respect to heat and cold, drought and wet, differ every year, and data furnished for one year cannot with certainty determine for the next. They may approximate, but not equal. It is, therefore, wise for the agriculturalist to observe the flowering of

trees and plants, and the shedding of their foliage, as that is determined in every country according to the difference of soils, exposures, elevations and seasons. These are reliable, being the expositions of nature herself.

The budding, leafing and flowering of different trees and plants indicate the times for planting and sowing the crops in spring. The change in the coloring of the autumnal foliage and the fall of the leaf indicate the approach of winter. These all teach the farmer the beginning and the termination of vegetable life, the length of the season and the reliability of the climate.

The mountainous sections of Orange county have a remarkable influence upon the meteorology of the county. A current of air retaining vapor is forced up the acclivity of the mountain range to a lower temperature, and precipitation ensues. In this way clouds accumulate upon the mountains, and rain falls when the intervening plains are parched with drought.

This has been noticed in Orange county very often. Clouds were seen rising over the Shawangunk range, following its course north and south, separating into two parts, the one passing over the Warwick mountains to the Highlands, the other over the hills of Ulster to Marlborough, and both joining as it were over Butter hill or the Fishkill mountains, pouring out torrents of rain, and shaking these rocky eminences to their foundations with heavy thunder. The artillery of the clouds is here discharged in its loudest roar, and the echo thereof is heard reverberating from cliff to cliff until it is scarcely perceptible in the distance. These are the thunder mountains of the Hudson river; and while they are often deluged with showers, the level country (the interior of the county) is parched and dry. These showers, passing along the Shawangunk and Warwick range, impart to the grasses of those districts peculiar lusciousness and sweetness that render them fit for dairy purposes. In all the county of Orange no portions excel these for rich milk and good butter.

The amount of rain that falls in Orange county varies from year to year, from 30 to 41.69 inches. During the year 1858 there fell at Newburgh, in January, 1.86; in February, 0.8; in March, 0.9; in April, 2.4; in May, 4.1; in June, 3.8; in July, 3; in August, 3.6; in September, 1.4; in October, 2.3; in November, 4.3, and in December, 1.6—making 30.06 for the year. It is noticeable that during the spring 7.04, during the summer 10.4, and during the autumn 8 inches fell, being so distributed during the season of vegetation as to render the season very productive.

In the mountain ranges of the county we have noticed that the vapor contained in the air is often condensed and precipitated in the form of rain. This condensation of the vapor produces a local heat in the atmosphere beyond the natural temperature, and materially affects the climate of those places. For these reasons some of the cloves and ravines of the Highlands are far more temperate than their elevation and latitude would otherwise warrant. Upon the top of Butter hill, in a scooped valley, to which we have made reference, owing to the interradiation of heat and the cause above mentioned, the climate is far higher than many other places through the mountains. The southern slopes of the mountains are far more temperate than the northern, and those valleys opening towards the south than those exposed to the north.

The winds blowing from the south and southeast are warm and damp, and will cause rain in a few hours. Those blowing from the southwest and west are warm and dry. The north and northwest winds are cool and dry. The northeast blowing for 24 hours, or more, will insure a storm—generally of some duration. The southeast storms are generally short and severe. Those from the west are generally in thunder showers. We notice, as a meteorological sign of rain, *when Butter hill wears a cap of fog*, then look out for a storm, but when the fog settles down and passes off towards Anthony's Nose, clear weather will ensue.

The cloves of the mountains down through the valley of the Ramapo are full as temperate, and develop the same meteorological data as the sections we have particularly mentioned; their soils, in places originating from primitive rocks, vary the temperature, and the open valley to the south imparts a greater warmth, while the ascending hills towards Ketchamtown shut out the north winds.

INDIAN CORN.

We have seen that the mean temperature of the county from April to the first of October is 66 deg. 76 min.—a range favorable to the growth and maturity of the general products of the farm. Corn is in reality a tropical plant, and yet its flexibility makes it easy of adaptation to climate and soil. It generally prefers moist, rich soils, with strong heat, and yet it will accommodate itself to northern cold climates, provided a range of temperature is furnished necessary for its production, which is shortened to a period often of 90 days. This range of temperature must not fall below 60 deg., or else the crop will not vegetate.

In Orange county the climatic adaptation to the growth of corn is very great. For a period of *five* months the temperature is above the necessary range for its growth and maturity, being 66 deg. 76 min., and all other things being equally favorable, the production of this crop must be good and very abundant.

The variety mostly cultivated in Orange county is the *white flint corn*, and sometimes the *eight-rowed yellow corn*. The yield of the former has been known to reach 135 bushels of shelled corn to the acre; that of the latter 105 bushels.

The soil for corn is generally made rich, dry and thoroughly pulverized. It is understood by the farmers of Orange that corn is a *gross feeder*, and ranges over a great space in search for food. They, therefore, keep the soil both rich and thoroughly tilled, to feed the crop fully and to produce a large growth and yield. Immediately after the corn comes up the land is plowed and crossed, the weeds and grass pulled out, and loose, rich soil drawn around the hill. The plowing process continues, and by repeated stirring of the soil, the air, the warmth and the moisture circulate through it, the roots of the plant extend, sucking in the nutriment to repletion, and the crop grows luxuriantly to perfection.

Of the cultivated crops corn is the leading, and the most important and profitable to the Orange county farmer. More or less of it is used for food for cattle, for fattening hogs and beef cattle, and for poultry, and from the comparative certainty of obtaining a crop, under all the vicissitudes of

seasons, it is far the most profitable of all others. The soil is generally plowed in the spring, and the corn planted about the *tenth* of May, sometimes the *twentieth* of May, if the season is backward. It comes up in a few days, and is cultivated, until the ears begin to set, with plow, cultivator and hoe, and about the middle of September the crop is matured. We have known crops to yield as high as 135 bushels per acre, but the average for the county is far below that figure. The aggregate of the crop in 1860 was 538,743 bushels.

In the towns of Hamptonburgh and Chester the crop grows to the fullest average. In Warwick, Wallkill, Blooming Grove, Wawayunda, Newburgh, New Windsor and Montgomery, the produce is very good. In the towns of Greenville, Deerpark and Crawford the least, and yet, even in these towns, the yield is greater than in many of the corn districts of the State.

WHEAT.

We can remember the time when wheat was a staple production of the county. During the war of 1812, and afterwards, up to about 1840, wheat was grown, and the yield a fair average. It was during the range of high prices that the wheat crops of Orange commanded a mint of money. When the farmer took a load of fifty bushels to market at *twenty-three shillings and sixpence* per bushel, he realized quite an amount from it; and a yield of thirty bushels per acre made a *profitable income*. These were days of thrift.

About the year 1835 the crop began to fail, and after the year 1840 it ceased to be a leading production of the county. The worm, the fly, the midge, all succeeded each other in depreciating the crop, until it became unprofitable. Many efforts were made to continue the production by changing the variety and the culture. *The Mediterranean* was sown, as being more hardy and less liable to be injured by winter or by the fly and midge. Lands were tilled more carefully, were enriched more bountifully. Here and there a good crop was produced, but the average satisfied the farmers that other agricultural resources were far more profitable than the growing of wheat. It was therefore partially abandoned.

Small pieces are yearly raised in most of the towns; the largest area in Warwick, Crawford and Montgomery; the least in Greenville, Minisink and Monroe.

The soils of Warwick, Newburgh, Montgomery, Blooming Grove, Hamptonburgh and Chester are well adapted for wheat growing, as they contain much of the constituents of that crop; but as other branches of agricultural pursuits are found to be more reliable and profitable, those are pursued to the neglect of this.

In 1855 the crop in Orange was 43,364 bushels of winter wheat, and in 1860, 34,568 bushels; in 1861, 68,214 bushels.

OATS.

Oats are considerably grown in the county. The opening of spring generally allows the soil to be tilled, and the crop put in before the first of May, or by the tenth of May at the latest. This gives the crop an early vegetation and a mature growth, producing a heavy, plump berry.

Oats are generally sown upon lands cultivated with corn the previous year. The lands are plowed in the spring, and about three bushels of seed sown to the acre. It is well harrowed in and left to grow and mature. It ripens generally in July, and yields a fair return. The previous manuring for the corn crop renders the soil rich and adapted to grow oats. In some cases the straw grows rank and weak, and is liable to fall down, where the soil is too rich. The crop is found to be very susceptible of injury from drought during any stage of its growth. It is, however, quite exempt from depredations of insects. The crop is valued as a convenient forage for horses and cattle. It is grown quite largely in Crawford, Montgomery, Newburgh, Wallkill and Warwick. The smallest area is sown in Deerpark and Cornwall.

The production has been largely increased from 1855. The crop that year was 291,111 bushels; in 1860 it was 512,137 bushels; in 1861, 439,141 bushels.

RYE.

On the naturally strong soils of the valleys of the Wallkill, Otter kill, and other streams in the county, a large growth of rye is generally insured. Sometimes the straw grows too large, and the grain is consequently not quite as full and heavy as upon the hills. The soils, generally, of Orange county, are well adapted to the growth of rye; even the mountain soils of the Highlands, and of the south part of the county.

The rye grown in Orange is of the variety denominated "the white rye." The berry is large, plump, and replete with starch and gluten, the product of careful culture from year to year. Rye is generally sown in Orange before the wheat, in September. It obtains quite a growth before the winter sets in. If too luxuriant, it is fed off, and many a tub of fine butter is made off a rye pasture. In the spring it starts early, is in head by the first of June, and ready for harvesting by the first of July. It is generally cut *in the milk*, as it makes whiter flour and more nutritious food. The rye loaf of Orange county is indeed a luxury. It is sweet, nutritious and healthy. Many a time have we exchanged wheat for it, enjoying the trade in a manner quite rational to *the taste*.

The largest crops are grown in Montgomery, Newburgh and Warwick. The least in Cornwall and Wawayunda. The crop for 1855 was 202,301 bushels; for 1860, 233,848 bushels; for 1861, 264,050 bushels.

BUCKWHEAT.

This crop is grown in Orange, not as a leading product, but incidentally, to make out the variety. Where attention is given to its cultivation, it has been quite successful, particularly through the higher portions of the county. It is a crop quite sensitive of heat and cold. The hot sun of July and August often injures it, and when, perchance, an early frost comes, it cuts it down. Escaping these extremes the crop is generally productive, yielding from twenty to twenty-five bushels per acre.

Its use as a breadstuff is confined to cakes which are made of it. It is also a nutritious food for cattle, and the buckwheat bran contains materials good for milch cows, to which use it is generally applied.

Deerpark and Warwick produce the largest crops. Blooming Grove and Hamptonburgh the least. The crop for 1855 was 28,024 bushels; for 1860, 74,599 bushels; for 1861, 40,798 bushels.

BARLEY.

Barley is scarcely raised in the county, and has never been deemed a profitable crop. Whether the climate, or the soil, or both, combine to render it very uncertain, it is indeed quite uncertain and quite unprofitable.

In the year 1854 about *six* acres were sown to barley, and the yield was seventy bushels. In the town of Montgomery *nine* acres yielded ninety-nine bushels, and in Warwick *one-half an acre* produced seven bushels. This was the entire crop of Orange county, fifteen and a half acres yielding 176 bushels. During the year 1859 the entire yield was 160 bushels, showing that no attention is given to its cultivation.

The barley crop flourishes best to the north and west, where the climate ranges at a lower temperature, and the average will mature it, uninjured in its weight and substance.

POTATOES.

From the first settlement of the county until the rot made its appearance, this crop was numbered among its most successful ones. It was deemed not merely a favorite esculent for the table, but an excellent fodder for cattle and hogs. It was used in the manufacture of starch, and assumed a place of great importance among the products of the county. The tuber grew large, and the product was usually from 300 to 400 bushels per acre.

From 1840 the crop has been diseased, and the inquiry has generally been: "*How much have your potatoes rotted?*" Expedients were resorted to in order to save the crop. Experiments were tried to prevent the rot, but for years the rot continued—in some cases destroying all; in others a part. The disease was indeed *epidemic*, defying all nostrums and cures, running its course and then disappearing.

For the last year or two the crop begins to *recoup* in health and production. It assumes a freedom from disease, and puts on the appearance of olden times, when to plant a crop was to insure a profitable return.

Potatoes are raised in Orange, not so much as a field as a garden crop. Every family has its potato patch, large enough to supply the table for the year, but *few* families raise more than is needed for home consumption, except it be in the vicinity of Newburgh and New Windsor. There the crop is raised to a certain extent for marketing, and some few persons near the large villages "*raise them to sell.*"

The largest crops are raised in the towns of Chester, Deerpark, Montgomery, Goshen, Newburgh and Wallkill; the smallest in Cornwall and Greenville. The total crop for the county in 1854 was 123,552 bushels; in 1860, 215,106 bushels, and in 1861, 348,129 bushels.

PEAS.

Peas are not grown in Orange county as a field crop, but generally in gardens and small patches for table use. They are seen planted in rows and "*stuck*" near every domicil, and they yield full as great a return as any other crop. Strange that they are not more largely cultivated!

BEANS.

Beans are grown but little more than peas. They are found in every garden, and in some instances are seen in fields among the corn, or in patches of from a quarter to one acre. Their yield where they are carefully cultivated is full 25 bushels per acre, and with some attention can be made quite profitable. Cornwall, Warwick and Deerpark grow the largest crops.

TURNIPS.

Turnips are receiving increased attention in the county. Their easy cultivation and large yield make them a desirable crop. The Gray Court and Black meadows of Chester produce them largely, and many of the alluvial soils in Monroe are adapted to their growth. In Cornwall, Newburgh and New Windsor they are grown for marketing. In the other towns the crop is quite limited.

FLAX.

Flax was formerly a staple product of the county. Every farmer used to raise it for home use and to sell. The fiber gave employment to the men in winter to "break and to dress," and to the women to "spin and to weave." These were the days of *domestic industry*, when all joined indoors and out in the labors of the farm and family. Flax was quite a profitable crop, directly in the value of its fiber and seed, indirectly as it gave employment to members of the family, who without it would be *idle*, and because it made our men and women depend upon their own exertions for home comforts, and not upon the labor of others. These were the days before "*cotton became king*," and happy for our country if these days had continued to the present time. There is no flax raised in the county now. Yes, one town, Wallkill, reports half an acre, yielding 30 pounds, for 1854, and the whole product for the county in 1860 was 254 pounds.

HEMP.

Hemp was quite extensively grown in Warwick and Chester during the war with England, and after. The Gray Court meadows, the Black meadows and the low lands adjoinining the drowned lands are favorable to its production. But since the price of hemp has fallen, the foreign supply has crowded out the home production, and it is not raised.

GRASSES.

Under this head we include the plants used for hay and pasture. They are the most valuable of the crops produced in the county. The amount cannot be estimated by the hay cut, but by the aggregate of forage—pasturage of all the stock of the county throughout the year. What 8,000 horses, 41,000 cows, 3,000 working oxen, 15,000 sheep and 9,000 other cattle will consume approximates the aggregate of grasses produced in the county. The quantity of hay cut in the county in 1861 was over *one hundred thousand tons*. The pasturage must equal that amount, which at ten dollars per ton would amount to $2,000,000.

Farmers are too apt to overlook the value of grasses, and to neglect all inquiry as to their qualities, habits, adaptation to different soils, and their relative value. This ought to command the farmers' attention.

In the county of Orange are many varieties of *natural* grasses, that spring up spontaneously without cultivation. They afford sweet, nutritious pasturage, from which the finest beef and butter is produced. These natural grasses are found growing in swales and ridges, with a thick, rich turf, and intermixed with each other in appropriate proportions. Cattle will feed upon these with a zest that they decline in respect to other varieties.

It is upon these natural pastures that the dairy is most flourishing, and the quality of milk and butter the sweetest and the best.

The sweet-scented vernal grass, sometimes called the vanilla grass, is quite common in the older parts of the county. It is of the natural variety, and grows best on moist soils; starts very early, and is noted for its strong, agreeable smell, which, when cut, it imparts to the hay. It is not eaten by cattle with the same relish as other varieties.

"June grass," or "blue grass," is a hardy grass, and one of our most valuable varieties. It is generally found on moist, rich land, throwing out and forming a thick, dense mass of leaves, particularly relished by cattle. It is a superior grass for the dairy, and a superior quality of butter is made from it. This grass is found growing throughout the butter-making district of the county, particularly in Goshen, Minisink, New Windsor and Greenville.

The wire grass, *poa compressa*, is a very hardy grass, and will grow where no other grass can grow. It is probably the most nutritive grass known. All cattle eat it with relish, and fatten on it faster than on any other. It is said that "cows feeding upon it yield the richest milk and finest butter." It makes the best hay. It will grow amid rocks, on steep banks and gravelly knolls, under trees and other shaded places. Its stem keeps green after the seed has ripened, and even keeps green through the winter. It grows in all parts of the county; more profusely in Warwick, Wawayunda, Blooming Grove, New Windsor, Goshen and Chester.

The fowl meadow grass, *poa serotina*, is found in all parts of the county where the land is slightly moist or is *irrigated* by running water. It is a grass that keeps green after the seed has fallen. Its stock is always soft and pliable. It is good for pasturage, but more valuable for hay, of which it produces a large quantity. It is found in Monroe, Hamptonburgh, Montgomery, Crawford, and more or less in every town where the streams by overflowing their banks leave a deep and moist alluvian.

Meadow fescue, *festuca pratensis*, is always found in rich old grass fields, where the sod has become thick and the grasses mingled in rich profusion. It grows early in the spring, produces long leaves, furnishes good early pasture, and is readily eaten by cattle. In the grazing and dairy districts of the county it is held in high estimation as a reliable grass, as it will not "grow out," but propagates itself by shedding its seed.

Red top, *agrostis vulgaris* is distinguished as *large* and *small* red top, from the difference in size of their respective growth. These grasses grow in moist, wet soils; also on cold, wet uplands. They do not furnish first rate pasture, but yield a large supply of hay. Cattle relish these grasses, and they produce a large and regular growth through the season. More or less of these grasses are found in every section of the county.

Timothy or herds grass, *phleum pratense*, is extensively cultivated in the county wherever lands are laid down to grass. Timothy constitutes a part if not the whole seeding. It is sometimes mixed with clover, and furnishes good pasture and hay.

Orchard grass is cultivated in some parts of the county, though it is not held in very high estimation. It makes a good mixture with clover for hay. It will grow on slaty, dry soils. It starts early in the spring, is a good pasture grass, and keeps green throughout the season. It is well adapted to the soils of the south part of Blooming Grove, Chester, Warwick, Monroe and Cornwall.

Red clover is common in the county. It is distinguished as the large, the medium and small. The large is better for fertilizing purposes, is too stocky and coarse for pastures or hay. The *medium variety* is generally sown either alone or with timothy. Mixed with timothy, it makes the pasture more durable and the hay more substantial. When sown alone, it furnishes a good "*clover ley*" for wheat, and may be alternated with it for years. Clover is a better fertilizer than any of the forage plants. Its roots strike down into the soil from one to two feet, open pores for water to descend and act as conduits for the moisture to ascend, and when they decay and become incorporated with the soil, furnish a fine, rich, vegetable mold. The cultivation of clover in Orange county tends more to ameliorate the soil and to render it friable and productive than any other course in agriculture. It is to this that the farmer owes the capacity of his soil to produce the cereals and to sustain the fertility of his lands. There is not a town in the county where clover is not largely cultivated.

Lucerne, French clover, was introduced some years since with specious recommendations as to yield and adaptation to pasturage. Cattle are fond of it; even swine and fowls will eat it when tender. The plants will grow rapidly, and may be cut two or three times in the season, making good hay. It is preferable, however, for "*soiling*," and were the summers wet and less dry and hot, it would be invaluable as a forage plant, but it was not found to survive the colds of winter and the droughts of summer, and is but little cultivated in the county.

Millet was highly recommended several years ago as a substitute for the common grasses in seasons of drought; but as it was not relished by stock, its culture was quite limited. It is deemed a severe exhauster of the soil and a poor plant for hay, as inferior to oats, barley or corn stocks. It is not grown in the county to any extent.

Hungarian grass was also published as a valuable substitute for other grasses for hay and forage, but has not been much cultivated in the county. A farmer now and then made an experiment with it, but became better satisfied with the natural and cultivated grasses of the county.

Several other plants have been introduced into the county, and have received a partial cultivation for forage, but have been abandoned. Among these, we would name Sorghum, a family under which comes the Indian millet, Egyptian corn, *dourra*. These came round occasionally as something new, but, after trial, have been found to be old acquaintances, and not as good as our common broom corn. But the *Chinese sugar cane* possesses some valuable properties, and may make a good forage for stock.

THE DAIRIES OF ORANGE COUNTY.

No county in the State has a higher reputation for its butter, and probably no county produces more of the products of the dairy, or commands higher prices for those products. It may be said to be the principal business of the farming community. Since the opening of the New York and Erie railroad through the county the business has been divided into *milk* and *butter* dairies. The milk sold in New York city from the county, is deemed the richest and the best. These milk dairies are located along the line of the railroads, within a reasonable distance from the several depots. The milk is cooled and put in cans holding from fifty to sixty quarts, and carried to the depots in time for the "milk train" to the city, which runs daily from Port Jervis. These milk dairies are very profitable, yielding about $45 per cow, per annum.*

There are many *essential* things connected with the dairies of Orange county: farms naturally inclined to grass, an abundance of pure cold water, industry, perseverance, a close application to the business, and *experienced dairy maids.* These are not found, generally, out of the county, and accounts for the inferiority of the product elsewhere.

Among the Orange county dairies all are found to assist, the men, the women, the boys and the girls; they all join in milking and carrying the milk into the cellars; there *the girls* strain the milk, skim the cream, churn and work the butter, and pack it into tubs and firkins. The churning is generally performed by dog or horse power. The churns are large, generally barrel or two barrel churns, worked with a dasher, *none of your new-fangled things of small capacities, and smaller value, worked sitting down.* A churning produces a large pile of butter, and the packages are readily filled. We have known dairies of from 40 to 125 cows, and their products ranging from 80 to 250 firkins per aunum These dairies, when marketed, yield to their proprietors enough money to purchase a farm, and no class of her citizens are more thriving and independent than the dairymen of Orange. They are generally *before-handed,* and have money to loan, or to invest in real estate.

There is a method observed in the manufacture of Orange county butter. The cellar where the milk is kept is cool, well ventilated, clean. The milk is strained into pans containing from ten to twelve quarts each. When the weather is warm the pans are set on the cellar bottom, otherwise on shelves. The milk is left until it becomes "loppered," then the milk and cream are churned together. Some dairy-women skim off the cream and part of the milk, and churn that, but the best butter is churned from *milk and cream.* The churn used is the common "dasher churn," driven by dog, horse, or hand power, according to the size of the dairy. The churn is filled half or two-thirds full with milk, and a pail of cold water added before starting to churn. In cold weather warm water is put in. The

* The milk trade of the county of Orange is of increasing importance, and has been reduced to a regular system. The dairymen milk their cows morning and evening, and let the milk stand until it is cool before sending it to the depot. Some use cool cellars, others cool springs of water, in which the cans are put. The milk is sold to contractors, and delivered at the various depots daily. It is generally paid for by the contractors monthly. The aggregate amount sold from Orange county in 1861 was over *twenty-five millions of quarts.*

churning is performed with a slow, regular motion, and proceeds for an hour to an hour and a half, when the butter comes, and another pail of water is added. The butter is then taken out and washed through water in a large tray, and is then salted with about one ounce of pure Liverpool (Ashton) salt to each pound of butter. The salt is worked through the butter. It is then put in a cool place and left to stand an hour. It is then carefully worked over and set aside for five or six hours. It is worked again and set in a cool place until the next morning, when it is packed. In working the butter care is taken to work out all the milk, but not to work it too much, so as to break the grain and make it *salvey*. If the milk is left in, the butter will become rancid. If the grain is broken in working, it will be greasy or salvey. Butter worked just enough will be solid, sweet, yellow, and the drops of brine on it will be clear as crystal. The butter is packed in white oak firkins, the staves of which are selected so as not to leak the brine. The firkins will weigh about eighteen to twenty pounds empty. They are soaked in cold water a few days before used, by being filled with water. They hold from eighty to one hundred pounds of butter. When the firken is filled a linen cloth is placed over the butter, and on this a layer of salt an inch in depth is laid, made a little damp with cold water. The butter is then put away in a cool cellar, *none of your up stairs butteries*, but in a cool cellar where it stands until marketed. Then the salt and cloth are taken off, a fresh cloth wet with brine is put on, and the firkin headed up. Great care is taken to keep the firkins perfectly clean, their outside as bright as when turned out by the cooper. No leaky firkins, or any that will filter the least particle of brine are used, and consequently the butter goes to market in bright, clean packages, and commands the highest price.

The amount of butter made in Orange county for the year 1854, was 3,285,578 pounds, and for the year 1859, 3,033,805 pounds. The depreciation in product the latter year is owing to the increased quantity of milk sold, the increase being from 4,553,514 gallons in 1854, to 5,490,235 in 1859. Butter made in 1861, 3,507,304 pounds; milk sold 5,224,872 gallons. A good butter dairy, in Orange county, is estimated to yield from $35 to $45 per cow, each year.

There is but little *cheese* made in the county; the soil, grasses and water adapt better to butter. In the limestone formations of the town of Warwick cheese is made, about 80,000 pounds per year. In Monroe a small quantity is made, and in Greenville a very small quantity, but the aggregate yield for the whole county does not exceed 100,000 pounds—in 1861, 99,372 pounds.

FRUITS.

In the earlier history of the county but little was known of fruits, except of common apples, cherries, peaches and currants, such as would grow by the way side and produce uncared for. As an article of *comfort and luxury* their value was scarcely estimated, and few knew, by actual experience, the enjoyment of the best and most delicious sorts. Many had a few varieties of their own raising, and possessed a few scattered fragments of the yearly supply, which, at the present day, is found in almost every town.

One of the earlier cultivators of good fruit in Orange county was Noah Townsend, who lived in Bethlehem, on the farm known as the "Samuel McCoun farm," in the town of New Windsor. He was a careful cultivator, and made selections of the best varieties. He planted a nursery which was the origin of all the finer orchards in that part of the county.

After him, and as early as 1810, Mr. Samuel Downing commenced the cultivation of a nursery in Newburgh, and offered for sale trees of apples, cherries, pears, peaches and apricots. After him, his sons, Charles and A. J. Downing, extended the nursery, changed and renewed the whole system of fruits in the county, and in many parts of the country. Their celebrity became as widely extended as the products of their nurseries. A. Saul also planted a nursery in Newburgh, and furnished all the best variety of fruits known in the country. From these sources have grown the orchards and fruits of Orange county, and their abundance is now so great and so common in every family, that it may be said of them, as of the strawberries in the Parisian market, "let them fail for three days and there will be a revolution." For who, used to abundance of fruit the year round, could think of having the supply cut off without strong indications of an "outbreak."

APPLES.

Without entering into a particular description of the several varieties found in the orchards of the county, we will enumerate them as found among the most valuable:

Summer apples—Early harvest, red Juneating, or Strawberry Summer Pippin, Sweet bough and summer rose.

Fall apples—Fall pippin, (a very choice apple in Orange,) Gravenstein, Porter, Hawley, Pearmain, Autumn Bough, large Yellow Bough, Fameuse, Pumpkin Sweet and Seek-no-further.

Winter apples—Rhode Island greening, Vandeveer, Swaar, Baldwin, Seek-no-further, Pearmain, Danvers, Winter sweet, Spitzenberg, Ladies' sweet, Roxbury russet, the Green pippin, Belle fleur, Gilliflower, Cat head and Domine.

PEARS.

But few pears were grown in the county for near a century after its first settlement. There were some early and autumn pears, but no winter pears. It was not until new varieties were added by cultivators abroad and at home that the delicious qualities of this fruit were developed and became generally known. There are now produced in Newburgh and New Windsor, Cornwall and Montgomery, a succession of fine pears from the earliest varieties to the latest winter. These are deemed of great value as a desert fruit, for baking, stewing, preserving and for marmalades. The pear grows strong and vigorous upon rich loam of moderate depth and a dry subsoil. It succeeds well as an open standard, and requires but little care or pruning. They grow finely, and produce largely as *dwarfs*. These latter we found in village gardens, where smalll space is allowed for fruits. The varieties of *summer pears* grown in Orange county are Bloodgood, Bergamot summer, Bartlett, Dearborn seedling, Doyenné, Muscadine, Sugar top and Summer belle.

The *autumn pears* are Belle et Bonne, Bleeker's meadow, Beurre de Capiu-

mont, Beurre Brown, Beurre Diel, Beurre Kenrick, Bergamot autumn, Gansel's Bergamot, Doyenné white, Duchesse d'Angouleme, Napoleon, Seckel and Surpass Virgalieu.

Winter pears—Beurre d'Aremberg, Beurre Easter, Bergamot Easter, Columbia, Gloat Morceau, pound and winter Nellis.

PEACHES.

The peach has been produced in the county from its first settlement. The *pits* cast into the ground grew formerly without attention, and the crop was profusion. This continued up to about the year 1812, when the peach began to fail. The grub, the yellows, caused the tree to decay and die. It, however, is cultivated with great success in the vicinity of Newburgh, New Windsor, Canterbury and Washingtonville. Few trees are scattered through the county generally, but the main cultivation and production is in the eastern part of the county, where are found growing the following varieties: Brevoort, Coolidge favorite, early Anne, early Tilotson, early York, early Newington, early Sweet water, early Admirable, George the Fourth, red and white Rareripes, Noblesse, Snow, Crawford's early, Malacaton, Alberge, yellow Rareripe, large white Clingstone, (fine for brandy peaches,) lemon Clingstone and late yellow Alberge.

APRICOTS.

Apricots were not known in the county until after the year 1805. They were introduced into a few village gardens by way of curiosity rather than for their value; but being found to be somewhat productive and a delicious fruit, have been more extensively cultivated. They are now found in almost every fruit orchard in the vicinity of the Hudson river; but few in Newburgh are without them. The varieties grown are the following: Albergier, large early, Moorpark, Peach, Roman and red Masculine.

NECTARINE.

This beautiful fruit, so much like the peach in appearance and habit, is grown but in a very few gardens in and about Newburgh, New Windsor, Canterbury, West Point and Montgomery, and there not more than a tree or two. The varieties found in Newburgh are Boston, Hunt's tawny, Golden, Newington and red Roman.

CHERRIES.

Cherries were found growing in all parts of the county quite back to its earliest settlement. The *common morello* grew in clusters by the way side, and constituted the principal stock. After these came the improved English cherry—the trees larger, the fruit less tart and more luscious; and gradually came the hearts, the bigarreaus and the dukes, in goodly array, producing choice fruit from the early May until midsummer. The varieties grown in the county are yearly increasing. The best and the greatest are found in the vicinity of the Hudson river, and are as follows: Black heart, Black eagle, black Tartarian, Dawnton, Downer's late, early White heart, Knight's early black, Ox heart, American heart, Bigarreau, bigarreau Napoleon, Belle de Choisy, May duke, yellow Spanish, early May, Kentish and the Morello; the common kind good for cooking, &c.

There is a large double flowering cherry found in some of the gardens in Newburgh and vicinity, very ornamental. Its blossoms appear at the usual season for the flowering of the cherry, and are produced in the most showy profusion.

CURRANTS.

Currants are found upon every farm, by the side of every garden, growing in *wild luxuriance*, untrimmed and uncultivated. This is the general feature of their growth and production. It has, however, been ascertained that cultivation will improve the fruit, render it more fair, large and productive, and we find, in the best gardens of the county, that it receives careful attention. The common red currants of the gardens have been somewhat superseded by the *large red* and *white Dutch*, the Champagne, Knight's large red and Knight's early red.

CRANBERRIES.

The cranberry, though natural to some localities in the county, and with careful culture might be made productive, is not grown to any extent. There are many swamps where it can easily be produced, but as yet it has entirely been neglected. If cultivated, it would produce 100 bushels per acre, worth one dollar per bushel, and in many places throughout Orange county unprofitable lands might be made to yield large crops, and thus be converted to a valuable purpose.

RASPBERRIES.

Raspberries are quite common in the county. The wild grow profusely on almost every farm, and the cultivated are found in almost every garden. They take up but little room, and, receiving the slightest attention, produce abundant crops. Aside from the native red and black raspberries found by the side of every fence and hedge, there has been introduced the red Antwerp, Franconia, Fastolff and Victoria.

BLACKBERRIES.

Several of these are indigenous to the county, as the low blackberry, producing high flavored, sweet fruit, and the high blackberry, producing fruit more tart, but fine. Aside from these, have been introduced and cultivated for family and market purposes the Lawton and other improved varieties.

STRAWBERRIES.

These most delicious and wholesome of all berries grow in all parts of the county, and there is not a family but can enjoy

"A dish of ripe strawberries, smothered in cream,"

during the season of their maturity.

The native strawberries of the fields are found upon every hill side and in every valley. They are deemed full more delicious than the garden, being of a more sprightly flavor and of a richer taste. But in all the gardens of the county, patches of strawberries are found cultivated with great success. In and about Newburgh, Canterbury and West Point they are raised for marketing, and the principal varieties are the Hudson, large Early Scarlet, Black Prince, Elton, Hovey's seedling, Willson's seedling, Prince Albert,

Rose Phœnix, Burr's new pine, Alpine white. No small fruit of the orchard or the garden pay better for their cultivation than the strawberry, or add more to the luxuries of the *table dessert.*

MELONS.

Melons come appropriately within the family of "herbaceous fruits," of which they are the richest and most luscious. The climate of Orange county favors their cultivation, particularly in Newburgh, Montgomery, New Windsor, Hamptonburgh and Chester. Of the *green fleshed* melons raised in the county we notice the Citron and Nutmeg; of the *yellow fleshed,* the early Canteloup, the netted Canteloup, and of the *water melon variety,* the Imperial, Carotina, Spanish and Citron.

PLUMS.

Plums were more productive in former years than of late. The damson, the blue gage and yellow gage, used to be quite common throughout the county, but in the absence of careful cultivation plums will not flourish as of old. In heavy loam, or clay soil, the tree grows finely, and will yield abundantly, receiving due attention. In Goshen, Minisink, Wawayunda, Deerpark and Crawford, plums ought to be raised in full crops, where in reality but a small quantity are produced. At West Point, Buttermilk Falls, Canterbury, New Windsor and Newburgh, more attention is paid to their culture, and fair returns are realized. We notice the varieties grown as the following: Roe's autumn gage, Bleeker's gage, Denniston's superb, Huling's superb, Imperial gage, Jefferson, Washington, Egg plum, Yellow gage, Brevoort's purple, Cherry, Damson, Frost gage, Horse plum, Long scarlet, Morocco, Purple favorite, Purple gage, Magnum bonum, and Red gage. We have noticed in the inclosures of William Roe and Wm. C. Hasbrouck, Esqs., as fine varieties of plums as can be found in any private grounds in the county. Those produced by Harvey Weed, Esq., are large and beautiful. Their culture in Newburgh is not limited, but extend to every private garden and yard of the place.

GRAPES.

Grapes grow wild in all parts of the county, and many of the summer varieties are large, productive, and of good flavor. The native grapes of the county grow strong, with large, entire foliage, and with more or less hardness of pulp, and their flavor is peculiarly *foxy.* They trail upon trees and grow to a great length. We have known a single vine to cover the entire top limbs of large elms, and to produce rich, sweet and good fruit.

Professor Gimbrede, late of West Point military academy, cultivated the native grapes found in the county, largely, with great success, and he found their fruit greatly ameliorated and improved by cultivation, so much so that he came to the conclusion that by cultivation the native grapes could be made equal in all respects to the imported. This idea has appertained among grape growers generally, for in all our vineyards are found as the *standards,* and the *reliable* varieties, the *native* in preference to the *foreign.*

In all dry, warm soils of the county, lying upon limestone or calcareous rocks the grape will grow freely, and where the exposure is warm the products will fully ripen. There are several vineyards in Orange county in successful operation.

About the year 1835 Mr. Charles A. Hulse commenced the cultivation of the vine in the town of Hamptonburgh, about one mile north of Decker's (Otterkill). He set vines upon about one acre of land, an open, warm, slatey and gravelly soil. He succeeded well in raising fine Catawbas and Isabellas, and in manufacturing good wine, for which he received *a diploma* at the State fair held in Elmira, in 1855.

About the same time Mr. John Jaques, of Washingtonville, commenced the cultivation of the grape just north of the village, upon a warm ridge, sloping to the east and south. He set out several thousand roots upon several acres, and found the business quite remunerating. He erected a wine cellar, a grape house and press, and went largely into the manufacture of wine. His wines became quite a desideratum in New York, Philadelphia and Boston, where they were sold for medicinal and sacramental purposes.

The valleys and slopes of the Highlands are well adapted to the cultivation of the grape; the banks adjacent to the Poplopen's creek, from Fort Montgomery to Queensbury, and the Forest of Dean. The banks of the Hudson to the north bounds of the county are peculiarily favorable to its production. All the gardens in and about Newburgh, New Windsor and Canterbury, produce fine grapes in large quantities. Nothing is wanting to make the eastern towns of the county largely productive in grapes and wine, but increased attention to their culture and manufacture.

WEEDS.

Orange county is free from many of the noxious weeds that infest many of the counties of the State, and were it not for the droves of cattle that are brought into the county annually, many weeds appearing there would not have been seen within her limits. One of the most troublesome weeds to the farmer, the Canada thistle, is scarcely allowed to obtain foothold in Orange. It was well understood that if it was suffered to remain undisturbed, it will continue to increase until it has taken entire possession of the soil, to the exclusion of every other plant. It was therefore met, at its first appearance, with the scythe and the hoe, and driven from the county. But few farms contain it, and there the occupants and owners will regret their carelessness in permitting it to enter. It has been killed by mowing when in blossom and before it has seeded. The mowing must be continued as long as a root exhibits vitality above the ground. A thorough system of summer fallowing will destroy it. Let us here publish the warning to all farmers not to suffer the Canada thistle to obtain lodgment in their lands. In some of the western parts of the State of New York, fields are given up in despair to its possession, and they will not produce herbage enough to feed a rabbit.

The *pigeon-weed* is known in the county under the name of red root. It is found in fields of grain, but not in any quantities so as to excite attention. It does not increase as in some of the western counties of the State.

Wherever it appears it can be eradicated by fall and spring plowing. The fall plowing will cover and destroy the seeds that fall and germinate, the spring plowing will destroy those that come up afterwards. It is very noxious to the wheat and other crops.

Wild mustard (charlock) is a troublesome weed, and is difficult of expulsion where it is once lodged. The only way to destroy it is to cut every plant before seeding, as fast as they appear. Plowing will propagate it, for the seeds will lie buried for years, and vegetate when brought to the surface.

Ox-eye daisy is a perennial weed, and quite troublesome. Its propagation has been very rapid, and its destruction quite difficult. Many farmers do not seem to care much about its presence in their fields, and estimate it quite valuable for hay; but the careful, prudent agriculturalist will take the pains to exterminate it by plowing, and plowing the soil until it has entirely disappeared.

May-weed is often found in barn yards, along cattle tracks, and other places where the soil has been trodden hard. It is a bad weed in grain or pasture fields, as it injures the crop of grain and grass. It can be destroyed by cutting or pulling up by the roots.

Dock is found in many fields where but little care is taken to clean the soil. In the wet seasons of the year it can easily be pulled up by the roots, or grubbed up several inches below the surface. Mowing will not kill it.

Burdock is a rank growing plant, found near every farm house, and upon the borders of every *ill* cultivated garden and field. Its burrs are injurious to the fleeces of sheep, reducing their value. It is a biennial plant, and cannot be destroyed by cutting. It must be grubbed up. It is of some medicinal importance, but not enough to warrant its propagation.

St. John's wort is found in rich soil, where the fields have been more carefully manured than cleansed of foul weeds. It is injurious to sheep and horses, causing their mouths and noses to scab and become sore. It is perennial, will grow two feet high, with strong, herbaceous, four-cornered stems and terminal flowers. It should not have place upon a well cultivated farm.

Bind-weed.—There are several varieties of these trailing weeds. The *convoluulus sepium* is the most troublesome. Another variety, called the *arrow bind-weed*, of climbing propensities, is troublesome in grain. All these should be carefully eradicated.

Snapdragon is one of the most troublesome weeds found in the county. It was introduced with the cattle driven from sections of the country where the pasture fields were infested with it, and it will spread from field to field with great rapidity. It yields an immense quantity of fine seed, which is carried by cattle and the birds from field to field, and from town to town. Its roots are small and fibrous, retaining great tenacity of life, and, though torn and scattered in fragments, will grow luxuriantly. Neither plowing nor cutting will kill it. It cannot be pulled out by the roots. The only way to get rid of it is to dig it out root and branch. If a small fiber is left it will grow and spread. Many farmers put salt upon it, and let the cattle and sheep feed it off. This will do if the process is

continually repeated. A week's intermission will frustrate the whole. It is a vile weed, injurious to pastures. Cows feeding in fields infested with it will yield milk impregnated with its unpleasant flavor, and the butter will taste of it. We regret the record of the existence of this weed within the county. Vigorous efforts ought to be made for its extermination.

There is a small plant growing in some places, particularly in gardens, the "queria Canadensis," or *forked chick-weed*, somewhat troublesome, and not easily eradicated. Its presence is a continual admonition to the proprietor and occupant, *that he is not as careful of his possessions as he ought to be*, and that a *little more attention* to these things would render them far more beautiful and productive.

Shepard's purse is injurious to pasture and to crops. It is found growing in several portions of the county. A species called *yellow seed* or *false flax* was somewhat troublesome in flax fields, and was formerly introduced with flax seed, as the *sorrel* has been with grass seed, to the injury of many of the pasture fields. In the same way the *plantain* found its way into the county.

Part VII.—Farm Houses and Farm Buildings.

In the first settlement of the county many bought and settled upon land without having in hand the requisite means to erect substantial farm buildings. They put up their log cabins and barns, and roughed it in the bush the best they could, or sold out and tried their fortunes elsewhere.

A large portion of the first settlers of the county were men of means, either in money, or of determined and untiring industry. These erected for themselves habitations, both durable and convenient, which have stood the test of time, and are now classed among the best in the county.

The life of these pioneers was in the main dignified and free, yet simple and plain. Their means did not allow them, nor their tastes lead them, to build any but simple and fitting houses, unambitious in style and appropriate in character. They were not ambitious to erect large, showy buildings, with filagree outside decorations, and full of inside inconveniences, but they displayed good taste and economy throughout, which accords best with the principles of propriety, and the rules of rural architecture.

The old Gray Court house, built by Daniel Cromline, in 1716, remained for years noted as being the largest and the best house between the Hudson river and New Jersey. It was built of stone, in the most substantial manner. It was large, spacious and convenient; its style somewhat of the English cottage, deemed at the present day very appropriate for farm buildings. It remained standing until a few years since, when it was demolished to give place to a new edifice.

William Bull erected the stone house in Hamptonburgh, in 1726, which is still standing and occupied by one of his descendants. William was a mason by trade, and built the house, his wife attending him part of the time. The walls are thick and massive, carried up two stories high. The shingles that covered the house were of oak staves. While the house was being built, the wall of the east end was cracked by an earthquake, from

the lower part of the first story, up through the second story. This was plastered up, and is visible at the present time. It was also struck by lightning when occupied by Daniel Bull, the ancester of Ebenezer Bull, who afterwards occupied it, and the scars caused by the lightning are still visible. This house is still standing as evidence of the good taste of its architect, and is now in possession of one of his descendants. It is as good a farm house as can be found in the town—plain, convenient, substantial, durable.

The Cadwallader Bull house, in the town of Hamptonburgh, on the road between Goshen and Montgomery, was built in 1760; was erected by Thomas Bull, who was the ancestor of Cadwallader. He was a mason, and for several years was engaged in dressing the stone for the building, which he shaped and fitted to their places. The walls of this house are as perfect now as they were when finished. It is a large house, and deemed now one of the best between Goshen and Montgomery.

Coldenham house was built as early as 1728, by Cadwallader Colden, known as Lieutenant-Governor Colden. It is one of those spacious, convenient and substantial houses, so adapted to the character of the builder and to the design of its erection. Few houses in the county harmonize more truly with the farm than this. It is kept in good repair and will endure for generations.

The John Ellison house, standing about two miles west of the village of New Windsor, was built by Mr. Ellison, in 1735. The architect was William Bull, the mason. It was built in the old English cottage style, a story and a half, with dormer windows. The ceilings are high and airy. The walls are decorated with carved and panel work in wood, the same as was in vogue among the English farmers of those days. Its present owner, Major Morton, has placed it in good repair, preserving all the principal rooms in their original style of finish. Its situation is pleasant and romantic, and its whole appearance reminds one of the rural scenery of Old England, where houses were built for generations. It is a fitting subject for the artist, and an original from which the farmer may draw copies in rural architecture.

In 1780 Elihu Marvin erected the brick house near the eastern shore of the Graycourt meadows, in the town of Blooming Grove, known as the "old Marvin house," and lately in the possession of Nathan W. Helme, its late owner. It is two stories high, and very convenient throughout as a farm house. With proper repairs it may last for ages.

Not far from this, and towards Craigville, William S. Woodhull erected a substantial farm house of stone, two stories high, and in every respect the *tout ensemble* of the domicil of a thriving agriculturalist.

Near the Bethlehem church, in Cornwall, Mr. Henry Walsh erected a similar house upon the farm in occupation of his son, A. Walsh. These buildings will all stand, long after the last wooden structure has passed away, and their remembrance exist only in tradition. We admire them because of their permanence, and because they give the impress of the minds of their builders, and are identified with the early history of the county.

These builders seemed to study the fitness of things, not only in the

design of their houses, but also in the choice of the materials. The county abounding in stone, from the finer granite to the common graywacke, presented to them the best of building material at hand for building purposes. These men were forming and founding settlements for themselves and descendants. They had an eye to this in the erection of their houses, and they put up dwellings that their children, and children's children might inhabit for generations to come; and in the county many of these farm houses are now occupied by the descendants of the original proprietors, as if the designs of the builders, as expressed in their houses, gave permanence to the family possessions.

The old Hasbrouck house, in Newburgh, built in 1750, is also of stone. It is known as *Washington's headquarters* at Newburgh, and is now the property of the State, and in a good state of repair, being kept as a memorial of revolutionary times, and open to public inspection.

This building and the surrounding scenery being of national celebrity, we subjoin a sketch, which for mountain, water and rural taste can hardly be surpassed.

About the year 1800 a new style of farm houses became fashionable in the county. These were of wood, the main building two stories high, the roof hipped and steep, and wings back for kitchen and offices. They were generally painted white, sported a piazza in front, and upon the whole looked quite imposing and pretentious. They were followed by a better class of buildings, somewhat varied in arrangement and more substantially built, being filled in with brick and the floors "*deadened.*" These buildings are now seen in every town in the county, and are replete with all the conveniences for farming purposes. The following is a specimen of many in the county:

Also the following is quite common in parts of the county where a little more character and style are designed:

WASHINGTON'S HEAD-QUARTERS, NEWBURGH, N.Y.

BARNS AND SHEDS.

The barns have been very much improved in the county from the common ones in use fifty years ago. Their arrangement is more convenient. They are more comfortable in every respect, containing stalls for cattle, in which they feed and lie down, sheltered from winds and storms and cold.

The cattle stalls are made with the floor descending to the rear, with a *drop* of four or six inches to receive the manure, with stanchions or gates to retain the cattle separate from each other. Sheds are arranged around the barns to break off the winds and to secure the other stock from the storms. Many of the barns have cellars, in which roots and tubers are kept for use, and cisterns or wells within cover for a supply of water, which is readily conducted to every stall. These conveniences render the keeping of stock extremely economical and profitable, and add much to the pleasure of that branch of farming industry.

FENCES.

Probably no farms in the State are better fenced than the farms of Orange county. They are generally made of stone, of which there is an abundant supply. These fences are usually laid dry, two to three feet wide in the foundation, four to five feet high, and a foot wide on the top. Great pains is taken in their construction; the stones are laid level and compact, and well *bound together*. Where the ground is liable *to heave* with the frost, the stone walls are banked with dirt to prevent it. They are often capped with rails as a defence against sheep jumping over. These fences are very durable and very reliable, and are the most common in the county. Where the stone is not plenty, a wall is laid two and a half feet high, with posts inserted, upon which to nail two strips of boards above. This makes a very good fence, and is quite common in the valleys

of the Otterkill and Wallkill, but where the stone is found in abundance the walls are generally carried up to the full height of the fence.

Post and rail, post and board fences are found where stone is wanting, but are more generally seen in the vicinity of villages and farm houses, where a more light and airy fence is desirable.

In some of the towns of the county a practice formerly prevailed of lopping the small trees and saplings upon the fences, in the way of repairs, until the fence and loppings would occupy a rod on each side of the fence proper, and a large area of brush, weeds and brambles sprung up along the hedge row, but this practice is fortunately subsiding. The loppings are chopped out, the weeds, brush and brambles are destroyed, and the fences begin to assume an appearance of studied care and refinement, much to the good looks and character of the neighborhood.

Agricultural economy, as understood in Orange county, is a *complex* term, meaning to take good care of the farm, and also to make money in the farming operations. The economy of the farm is looked upon as that which concerns the proprietor to maintain the original fertility of the soil, to improve it, add to its capacity to produce, consequently to sell the greatest quantity of produce from it, and thus to increase in wealth, and in the means of acquiring it. It is deemed as poor economy to starve the soil as it would be to starve an ox or a cow. "Feed the land, and it will feed you in return; starve it, and it will starve you," was the trite remark of a Blooming Grove farmer. In it consists the true idea of agricultural economy.

Feed the soil *fully* with all the elements that are taken from it by the crops, and it will remain fertile to produce the same crops from year to year. But take from the soil the constituents of production, it will cease to yield the usual crops, because it is denied the food essential to impart strength and capacity to produce crops.

The system of agriculture pursued in Orange county is calculated to keep the soil rich and fertile. The lands are kept in pasture for grazing purposes; are not fed off so as to expose the ground to the heats of the summer or the frosts of the winter, but the grass is left in thick velvet masses all over the field, the cattle browsing here and there the tenderest blades and the sweetest mouthfulls, leaving the mass to fertilize the soil. In none of the dairy and grazing districts of the county will you find the grasses "fed into the earth," and if perchance a field is found thus starved, it is the exception, and belongs to some improvident person who expects to sell out and move elsewhere.

Some incovenience is felt in the county resulting from a want of *economy in preserving the forests*. Steep side hills and rocky ledges where timbers could grow permanently were stripped of their protection, and the action of the sun and rain deprives them of their vegetable mold, and they become unproductive and barren. The farmer is too apt to forget that forests serve as reservoirs and equalizers of humidity; that in wet seasons the decayed leaves and spongy mold retain large quantities of the falling rain, and give back moisture in dry weather by evaporation, or through the medium of springs and creeks. Thus, sudden floods are prevented equally with parching droughts. The suddenness and violence of freshets increase

in proportion as the land is cleared of its forests, and large quantities of rich soil are carried down by the floods into the large streams and rivers, whereas, by a careful economy in preserving the forests upon side hills and rocky declivities, much of this could be prevented. The farmers of the county begin to understand this, and are more solicitous to preserve clumps of trees throughout their possessions, and the original forests upon the steeper hill sides and rocky precipices. These add much to the rural scenery, as well as to the comforts and utility of their presence.

There is no process by which lands can be made more permanently productive than *by draining*. We remember the time when moisture was deemed essential to fertility, and that wet places were deemed the most productive; but now the farmer is taught by experience that moisture in land, resulting from obstructed and standing water, injures the fertility of the soil, by rendering it cold and hard—impervious to air and heat. These moist, unproductive places, are indicated by continued dampness and coarse grasses. These drained will yield full crops, and the soil become permanently fertile. It is not moisture, so much as stagnant, pent up moisture, that injures the soil. Moisture should be as free to percolate and to run off, as it is to fall upon the earth. This is the idea of drains properly constructed.

This subject is receiving increased attention in the county. Many of the farmers in New Windsor, Blooming Grove, Goshen and Wallkill are draining their lands, and reaping the advantages thereof in better crops and more constant returns. The clay soils of those towns are made more permeable to air and warmth, and more fertile.

Many of the farmers of the county, by draining, double the produce, and thereby double the value of their lands, which is equivalent to doubling the quantity of acres in their farms, and far better than buying more land, as by thus cultivating and improving one acre they reap as much as they could otherwise from the tillage of two. We have known some farmers in the county who by these means produce as much from 100 acres as others do from 200, who leave their lands wet and undrained. Even in the dairy and grazing districts the advantages of draining are realized in finer grasses and fuller crops of hay. A late prominent farmer of the county used to say, "dig ditches to carry off the water, and these will open up sources from whence the grasses and crops may draw food from the subsoil." There never was a more true motto.

The agricultural economy of the county is marked with evidences of improvement not only in the operations of the farm, but also as to the estimation of the profession. The farmers of the county begin to honor their occupation more than in former years. There was a time when the false notion prevailed that labor was dishonorable, that any other business was more creditable, and even the *genteel loafer* was held in higher estimation than the farmer. These notions are exploded in Orange county; men of science, men of eminence, in the moral and political world, have held the plow, and labored on the farm, and the idea is cherished among all that the most honorable way for man or woman to live, is in the way ordained of God, and in the way our natures demand, to *seek for health and sustenance by the labor of our hands.* Among the leading farmers of the county

no idlers are allowed within their domicils; all join, men and women, boys and girls, in the labor of the household and of the farm. They deem it honorable, and are *not afraid* of being seen in the performance of useful labor. From such men and women, boys and girls, comes the celebrated butter which has added so much to the celebrity of the county. And from such come the farmers, and the farmers' wives, who are an honor to their profession and to their county.

It must not be inferred from the above that an unmitigated grossness characterizes the farming pursuits of the county. The *useful* and the *beautiful* are happily blended with the pursuit, and there is found within the county more of the useful, embellished with the beautiful associations of cultivated minds, and render the occupation the most delightful pursuit to which taste and intellect can be devoted. The farmers, their wives, their sons and daughters, who labor in their several departments, are refined and educated. They can adorn the field, the kitchen, and the drawing-room with equal ease and grace. The girls who go out to milk, night and morning, who *tend* the dairy, are the *genuine* ladies of the land. Useful, graceful, beautiful, everywhere. And the boys who plow and sow, reap and thrash, are the scions of the true nobility, from whence spring the honored, useful citizens of the country.

The farmer's home in Orange county is expressive of the character of the occupant and proprietor, It exhibits a unity, or a completeness, as a whole, which favorably impresses the mind, and this is beautifully blended with a variety in the details, both within and without, that shows design and fitness in all its parts, and the whole is made to harmonize with the occupation, the place, and the surrounding scenery. Comfort, utility, and convenience, are the leading features; these properly disposed of, embellishment and show enter afterwards, but not in any way to detract from or mar the other. Thus, while is found in the farmer's home everything fit and convenient for the farmer's occupation, embellishment in furniture and flowers, and disposition of grounds are also seen, not gaudy, glaring, or pretentious, but rich, substantial, and in good taste, harmonizing with the place and the circumstances of the owner.

There is not that glare and glitter about the farmer's home, as is found around the *cocked-hat cottages*, or the *dwarfed temples* of upstart fashionables, but there is a repose, a dignity, a significance throughout, that impresses the mind with an idea of taste and comfort, of substantial enjoyment, to which these latter can lay no claim. Such a home, how admirable its moral influence; how pleasant its associations; what a dwelling place for the most exalted virtues, the truest piety, and the most devoted patriotism! Here letters, science, and the arts have their altars. Here sentiment, thought, and the most lofty attributes of the mind are evolved. Living in such a home, and surrounded by all that is beautiful and attractive in nature, the farmer feels the dignity of his calling; that *his* is health, strength, contentment and independence; that his position in society is central and fundamental; that it is honorable, and he bows to no man or class of men as their inferiors.

AGRICULTURAL SOCIETIES.

In 1808 the farmers of the county turned their attention towards the formation of an agricultural society, as is seen by the following notice:

GOSHEN, *October* 25, 1808.

SIR: In pursuance of authority given us by a meeting of a number of gentlemen of the town of Goshen, on the twenty-second instant, in this village, for the purpose of devising a plan for establishing a society in this county for the promotion of agriculture and the arts, we were directed to give you notice that a meeting will be holden at the court house, in this village, on the twenty-second day of November next, at ten o'clock in the forenoon, for the purpose aforesaid, and to request you to attend and become a member of said society.

Very respectfully, yours,

JAMES W. WILKIN,
DAVID R. ARNELL.

This movement was cordially seconded by several citizens of Montgomery and Hamptonburgh, and in the former town an "agricultural association" was formed.

In 1818 a full organization was formed of a county society, of which William Thompson was chosen president; Selah Tuthill and George D. Wickham, vice presidents; David R. Arnell, treasurer; John Caldwell, corresponding secretary; Hector Craig, recording secretary, and committees on agriculture, manufactures, and domestic animals, appointed.

The first county exhibition was held at Goshen, the seventh of October, 1818. A newspaper of the day remarks:

"This being the first exhibition of the kind in the county, it was not expected there would be much competition or many persons present. All were agreeably disappointed. The meeting was very numerous, and composed of citizens from every part of the county. The animals and domestic manufactures entered, reflected much credit upon those by whom they were presented. All were convinced that nothing had been wanting but a society of this description to induce our farmers to enter into a competition so honorable to themselves and beneficial to the county."

The following premiums were awarded, viz: To Wilmot Moore, $20 for the best bull; to Daniel Tooker, $20 for the best stud horse; to Thomas Waters, $15 for the best pair of oxen; to Benjamin Strong, $15 for best fat oxen; to Gabriel N. Phillips, $10 for the best calf; to Totten Dusinberre, $10 for best four swine; to James W. Carpenter, $15 for best piece of cloth.

An address was delivered by the president, and the ceremony was closed with prayer. The society continued its organization until 1825, and held its annual meetings, awarding premiums, which, from the records, were generally distributed through the several towns of the county. We make record of the following:

1820. Jacob Wood, of Newburgh, $10, for best six sides of sole leather.

1821. William Acker, $5 for second best hogs; John Neilly, $10, best gelding; Emily Downing, $6 for best piece of diaper.

1822. Johannes Miller, of Montgomery, $10 for best farm.

1823. Joseph Caldwell, $10 for best piece of winter wheat, thirty-eight bushels per acre.

1820. Daniel Bull, of Crawford, best farm 100 acres, $20; Alexander Thompson, $15, best corn, 115 bushels per acre.

1822. Moses Crawford, best and largest quantity of butter, $10; do do, best white flannel $6.

1820. Samuel Mills, of Wallkill, best corn, $15; Moses Philips, $8, best woolen cloth.

1822. Stephen Ingersoll, $10, best farm in the town; Absalom Weller, $8, best potatoes.

1820. Wilmot Moore, of Minisink, $5, best calf; Asa Dolson, $15, best bull.

1822. Nathan Halse, $10, best farm in town; Charles Dunning, $10, best flax.

1823. James Halse, best four calves, $6; Nathan Halse, $25, best improved farm.

1820. Alanson Austin, of Warwick, $10, best wheat; James Burt, $6, best diaper.

1821. Benj. Bloomer, $20, best wheat.

1820. James W. Carpenter, of Goshen, $10, best cow; Selah Mapes, best oxen.

1821. Joseph Denton, $5, best boar; Philip Fink, $10, best fatted cattle.

1822. Gabriel Stewart, $15, best gelding; James Bradner, $10, best mare.

1820. John McGalvin, $20, best butter, in Blooming Grove; Joseph Moffatt, $8, best woolen cloth; Nathan H. White, $4, best linen cloth.

1821. John McGurran, of Blooming Grove, $20, best butter; John J. Brooks, $4, best piece of diaper; Moses Ely, $15, best stud.

1822. John McGurran, best butter; Selah Strang, best cow.

1820. Ezra Palmer, $12, for best gelding in New Windsor.

1822. Abram B. Rapalje cut greatest quantity of hay without the use of ardent spirits, premium of $15.

Under the act of 1841, "for the promotion of agriculture and household manufactures," the citizens of Orange reorganized their county society, and have continued to hold annual meetings, and award premiums, to the present time. The annual fairs have been well attended, and the exhibition of cattle, manufactures, and agricultural products has been creditable to the county.

We record some of the premiums awarded, as evidence of the productive capacity of the farms in the county, and of the careful tillage of the farmers.

In 1846 three premiums were awarded on Indian corn. The first to Israel Crawford, of the town of Crawford, 139 15-32 bushels per acre; the second to Hamilton Morrison, of Montgomery, 108 24-32 bushels per acre; the third to John A. Smith, of Montgomery, 97 30-32 bushels per acre.

Two premiums on oats; first to Hamilton Morrison, of Montgomery, 92 16-32 bushels per acre; second, 49 bushels per acre.

Two premiums on barley; first to Daniel C. Wisner, of Wallkill, 61 20-32 bushels per acre; second, 42 bushels per acre.

The first premium on wheat, 32 bushels per acre.

In 1847, first premium on Indian corn to Wm. Mills, of the town of Wallkill, 140 bushels per acre; second premium to Israel Crawford, of Crawford, 129 bushels per acre; third to James Patten, of New Windsor, 127 bushels per acre.

First premium on wheat, to Henry Robinson, of Newburgh, 42 bushels per acre; second, to H. Morrison, 35 bushels per acre.

First premium on barley, to John C. Wilbur, of Wallkill, 55 bushels per acre; second, to John Pattison, of Goshen, 48 bushels per acre.

Premium rye, to H. Morrison, of Montgomery, 45 bushels per acre.

Premium potatoes, to H. Morrison, 320 bushels per acre.

In 1848 the first premium on wheat was awarded to H. Robinson, of Newburgh, 42 bushels per acre, weight 64 pounds per bushel.

The annual exhibitions, each year, were large, and fully successful in each department. In horses were many noble animals. In cattle, always worthy of the first milk and butter county in the State. In sheep, excellent in quality. In poultry, a great variety of improved breeds. In agricultural implements, new and of acknowledged usefulness. In butter, superior in quality. In farm products, giving evidence of care and progress in this branch of agricultural industry. In garden products, such as receive the highest commendation. In fruits, a great variety; and in the ladies' department, a full display of the products of domestic industry and of the fine arts, creditable alike to the contributors and to the county.

As the effects of these exhibitions upon the agriculture of the county, we notice great improvement in all its departments, and a high stand in all her citizens. In the words of a former president of the county society, "the present condition of Orange county is gratifying to contemplate. The state of her agriculture is constantly advancing. New and improved modes of tillage are being practiced. The aid of science is invoked. Draining is extensively practiced with the best results. Many acres of waste and unreclaimed lands are yearly brought under cultivation. The value of her real estate, already great, is rapidly increasing. Her fruitful soil yields abundantly, and her staple products command remunerative prices."

Part VIII.—Description, Agricultural and Manufacturing Statistics of the Several Towns of Orange County.

BLOOMING GROVE

Is bounded north by New Windsor, east by Cornwall and Monroe, southwest by Chester, west and northwest by Goshen and Hamptonburgh. The south and east part of the town is mountainous; the north and west rolling. The soil of the valley of the Otterkill is sandy and gravelly loam, partly alluvial; of the hills, clay and gravelly loam. Between Blooming Grove and Craigville the surface is broken by ridges of rocks, and the soil is shaly. The town, generally, is productive in corn, oats, wheat, rye and hay. The pasturage is devoted to milk dairies and grazing. Some of the most profitable dairies are kept in the southern part of the town. The principal creek is the Otterkill; its tributaries, the Cromline, Satterly's and Goldsmith's creeks. A part of the Gray Court meadows lie in the town,

near Craigville. Washingtonville is the principal village on the Otterkill; population 375, and three churches. North of this village is the vine yard of John Jaques & Son. Salisbury Mills, on the Otterkill, two miles east of Washingtonville, population 250; has church, paper mill and grist mill. This place was early settled by the Caldwells and Parks, who were exiled from Ireland in 1798. Craigville, on the Cromline creek, has a church, cotton factory, and about 125 inhabitants. Blooming Grove Church is a small hamlet. Oxford Depot is a station on the New York and Erie railroad. The Newburgh branch road passes through Craigville, Washingtonville and Salisbury Mills. In 1735 Thomas Goldsmith and Nathaniel Dubois settled in the town; after them came Col. Jesse Woodhull, Tuthill, Brewster, Strong, Helme, White, Mathews and Brooks. The first church was organized in the town in 1759; the first pastor was Enos Ayres. Satterly's mills were erected at an early day, in the south part of the town; Blagg's clove is in the southeast part. The total assessed valuation of real and personal property in the town, for the year 1861, was $1,252,801; total taxes, $7,923.83. Whole number of acres, 21,483, of which 15,491 are improved. Cash value of farms, $1,257,175; of stock, $144,996; of implements, $34,698.

Agricultural Statistics for 1861.

Acres in meadows, 5,490; tons of hay cut, 6,915; seed, 49 bushels. Wheat sown, acres, 304; harvested, 2,749 bushels. Rye sown, acres, 610; harvested, 9,762 bushels. Oats sown, acres, 426; harvested, 15,568 bushels. Corn planted, acres, 784; harvested, 28,794 bushels. Buckwheat, acres, 97; harvested, 1,654 bushels. Potatoes planted, acres, 107; harvested, 4,580 bushels.

Peas, bushels, 87; beans, bushels, 94; turnips, bushels, 1,740; apples, bushels, 2,790; cider, 79 barrels; grapes, 9,500 pounds; wine made, 2,500 gallons; honey, 987 pounds; wax, 75 pounds; working oxen, 268; cows, 2,497; other cattle, 586; cattle slaughtered, 297; butter, 108,654 pounds; milk sold, 887,240 gallons; horses, 397; mules, 8; swine, 1,646; sheep, 2,597; fleeces, 2,864; pounds of wool, 8,995; value of poultry sold, $1,947; eggs sold, $1,784.

Manufactures.

Cider mills, $525; blacksmith shops, $2,500; tin and sheet iron, $5,750; cotton factories, $30,250; paper mills, $31,345; painting and glazing, $1,525; coach and wagon manufactures, $4,150; spokes, $2,550; grist mills, $3,740; cooper shop, $975; saw mills, $1,750; boots and shoes, $5,150; saddle, harness and trunk, $1,500; tanneries, $9,500; cabinet shops, $1,250; chair factories, $575; butcher shops, $1,275.

CHESTER.

Chester is bounded north by Goshen, east by Blooming Grove and Monroe, south and west by Warwick. In the north part the soil is slaty loam, alluvial, and gravelly; in the south mountainous and rocky. Sugarloaf mountain rises 600 feet above the valley. The principal streams are the Cromline, and Black meadow. Gray Court meadows, in the north part of the town, are extensive, and thoroughly drained, and productive; Black

meadows in the west. The soil is productive in corn, oats, wheat, rye and hay. The milk and butter dairies are very profitable, and the markets good. The New York and Erie railroad passes through Chester and Oxford. The villages are East Chester, Chester and Westchester, three villages separate about one mile apart; they contain an academy, two churches, a bank, and near 1,500 inhabitants. Sugar-loaf, in south part, has a church, and 200 population. The town was first settled in 1716, by Daniel Cromline, who built the Gray Court stone house. After him came John Yelverton, Nathaniel Roe, and Jonas Seeley. The total assessed valuation of real and personal property in the town, for the year 1861, was $969,080; total taxes, $5,995.04. Whole number of acres, 15,889, of which 12,527 acres are improved. Cash value of farms, $797,804; of stock, $129,645; of implements, $27,667.

Agricultural Statistics for 1861.

Acres in meadows, 3,740; hay cut, 5,899 tons; grass seed, 39 bushels. Wheat sown, acres, 144; harvested, 1,287 bushels. Rye sown, acres, 459; harvested, 9,549 bushels. Oats sown, acres, 425; harvested, 15,232 bushels. Corn planted, acres, 697; harvested, 19,752 bushels. Potatoes planted, acres, 187; harvested, 16,974 bushels. Buckwheat sown, acres, 95; harvested, 572 bushels.

Peas, 75 bushels; beans, 37 bushels; turnips, 2,587 bushels; apples, 797 bushels; cider, 34 barrels; honey, 65 pounds; wax, 14 pounds; oxen, 154; cows, 1,962; other cattle, 496; slaughtered, 207; butter made, 29,544 pounds; milk sold, 1,194,587 gallons; horses, 395; mules, 4; swine, 859; sheep, 497; fleeces, 499; wool, 1,464 pounds; poultry sold, $1,439; eggs sold, $1,952.

Manufactures.

Blacksmith shops, $2,250; tin and sheet iron, $1,500; painting and glazing, $1,460; coach and wagon manufacture, $2,575; grist mills, $2,350; cooper shop, $780; boots and shoes, $1,850; saddle, harness and trunk, $1,575; butcher shops, $1,725.

CORNWALL.

Cornwall is bounded north by New Windsor, east by the Hudson river, south by Monroe, and west by Blooming Grove. This is a broken, mountainous town. The Highlands occupy the eastern part, rising 1,500 feet above tide; the Schunnemunk and its spurs, the western. The valleys are deep, crooked, narrow and rocky, through which roar mountain streams. The Otterkill passes through the north of the town into Murderer's creek. The Schunnemunk runs north into the latter. The Bog Meadow creek passes over a cascade, at Buttermilk Falls, into the Hudson. The soils of the valleys are clay, sandy and gravelly loam, and in many places composed of the debris of the adjacent hills and rocks. The mountains are too steep and nude for cultivation. Canterbury is a village in the northeast part of the town; has a woolen factory, tannery, and a population of 230. At Cornwall Landing are extensive brick manufactories. Buttermilk Falls, on the Hudson, has flouring mills, and a population of 307. Fort Montgomery, on the Hudson, has one church, and 100 population. Bethlehem, in northwest part, one church, population 60. Ketchumtown, in west, and

Townsendville, are hamlets. West Point is the seat of the United States Military Academy. There are barracks for cadets and soldiers, officers' quarters, buildings for library, apparatus and observatory, laboratory for ordnance and ammunition, hospital, chapel, dining hall, stables and sheds, church, and 150 houses for employees. Upon the mountain in the rear is Fort Putnam, and upon the extreme point the old Fort Clinton; south of this Koskiusko's garden. Near the old Fort Clinton is Koskiusko's monument, and to the extreme northwest the Cadets' monument. This is a place of peculiar interest; here commanded Washington; here were Koskiusko and Lafayette; here was the traitor Arnold, plotting treason against his country and the cause of human liberty. The first settlers in Cornwall were Germans, who sold out and left. Among the early settlers were Sands, Townsends, Van Duzers, Sackets, Sutherlands and Clarks. The first town meeting was held in April, 1765, at which Hezekiah Howell was voted supervisor, and John Brewster, Sen., clerk. The total assessed valuation in the town, for 1861, was $904,712; total taxes, $6,465.38. Whole number of acres, 25,115, of which 10,875 are improved. Cash value of farms, $1,825,142; of stock, $155,679; of implements, $25,719.

Agricultural Statistics for 1861.

Meadow, number of acres, 3,015; hay cut, tons 3,597; grass seed, 56 bushels. Wheat sown, acres, 227; harvested, 1,535 bushels. Rye sown, acres, 497; harvested, 5,878 bushels. Oats sown, acres, 382; harvested, 12,954 bushels. Corn planted, acres, 714; harvested, 12,545 bushels. Buckwheat sown, acres, 187; harvested, 974 bushels. Potatoes planted, acres, 105; harvested, 10,272 bushels.

Peas, 95 bushels; beans, 107 bushels; turnips, 2,784 bushels; hops, 95 pounds; apples, 3,597 bushels; cider, 48 barrels; market gardens, value of products, $2,967; grapes, 2,600 pounds; wine, 1,250 gallons; honey, 519 pounds; wax, 39 pounds; oxen, 224; cows, 1,297; other cattle, 617; slaughtered, 114; butter made, 97,967 pounds; milk sold, 58,917 gallons; horses, 487; swine, 1,684; sheep, 994; fleeces, 1,087; wool, 2,945 pounds; poultry sold, $1,465; eggs, $1,872.

Manufactures.

Blacksmith shops, $2,750; tin and sheet iron, $1,250; woolen cloth and yarn, $2,725; stone quarries, $18,540; wagon making, $1,525; grist mills, $87,190; cooper shop, $1,025; saw mills, $1,275; brick manufacture, $35,500; boots and shoes, $4,550; tanneries, $4,550; piano forte manufacture, $3,150; tailoring, $24,140; butcher shops, $1,250; barrel manufacture, $1,450.

CRAWFORD.

Crawford has the county line on the north, Montgomery on the east and south, and Wallkill on the west. The surface of this town is hilly and broken. The principal hills are the Collaberg and Comfort hills. They rise from 300 to 400 feet in height. The hill lands are slaty and clayey loam, and the valleys a gravelly loam, productive in grain and pasture. The hills are fine for grazing. The streams are the Shawangunk kill,

Dwar's kill, Great and Little Paughcaughnaughsing. They all run northeast into Ulster county. Searsville, on the Dwar's kill, has a grist mill, two saw mills, and about ninety inhabitants. Crawford, on the Shawangunk kill, sometimes called Pinebush, has a saw and grist mill and about one hundred and thirty inhabitants. Hopewell is a small hamlet, with a church in the southwest. Bullville in the south; population sixty-five. Collaberg, two miles east, is a post office. This town is productive in grain and the products of the dairy. Among the early settlers of this town were Joseph Elder, Daniel Bull, Jonathan Crawford, Andrew Thompson and Robert McCreary. The church at Hopewell was organized in 1779. The first pastor was Jonathan Freeman. The first pastor at the Graham church in 1795 was Rev. John McJimsey. The early settlers of this town endured great hardships and many privations before they had subdued the rough soils of their farms. It is said that Joseph Elder fenced his farm with stone walls, carrying the stones in his leather apron to the wall and putting them in their place. The town is noted for the industry and enterprise of its citizens, the high state of cultivation of its farms, the value of its products, and for the first rate quality of its butter. The total assessed valuation of real and personal property in the town for 1861 was $822,529; total taxes, $5,380,33; whole number of acres, 24,340; of which 19,894 are improved. Cash value of farms, $939,780; of stock, $125,640; of implements, $23,672.

Agricultural Statistics for 1861.

Meadow, number of acres, in 4,962; hay cut, 6,794 tons; grass seed, 22 bushels. Wheat sown, acres, 754; harvested, 7,114 bushels. Rye sown, acres, 1,164; harvested, 12,878 bushels. Oats sown, acres, 1,410; harvested, 42,694 bushels. Corn planted, acres, 1,560; harvested, 38,615 bushels. Buckwheat sown, acres, 217; harvested, 1,491 bushels. Potatoes planted, acres, 1,792; harvested, 97,651 bushels.

Turnips, 217 bushels; apples, 12,916 bushels; cider, 416 barrels; maple sugar made, 94 pounds; honey, 567 pounds; wax, 39 pounds; oxen, 282; cows, 2,467; other cattle, 676; slaughtered, 310; butter made, 289,615 pounds; horses, 584; mules, 6; swine, 3,719; sheep, 1,214; fleeces, 1,317; wool, 4,150 pounds; poultry sold, $3,250; eggs sold, $3,940; yards of full cloth made, 215; yards of flannel made, 473; yards of linen made, 584.

Manufactures.

Cider mills, $515; blacksmith shops, $2,575; carding and cloth dressing, $1,575; wagon making, $1,150; grist mills, $2,750; cooper shop, $1,250; saw mills, $1,790; boots and shoes, $2,125; tanneries, $2,450.

DEERPARK.

Deerpark is the extreme western town of the county. Its surface is mountainous, and broken into deep ravines through which run streams of water. The valley of the Neversink runs northeast and southwest through the town. The soil is rich and productive. On the east are the Shawangunk mountains, 1,800 feet high, and on the west are rocky, mountainous uplands, ending in steep declivities on the Delaware river. The principal

streams are the Mongaap, Bashe's Kill, Old Dam, Fall Creek, Shingle and Grassy Swamp brooks. The principal places are Port Jervis, on the Delaware, a station on the New York and Erie railroad, containing a foundry, a saw factory, machine shop, planing mill, bank, newspaper office, five churches, and a population of 3,023 Two miles west of Port Jervis is Honesville, at which is a large tannery and a population of 135. Huguenot, four miles northeast of Port Jervis, has a population of 131. Cuddebackville, on the canal, farther northeast, has a population of 72. Carpenter's Point, at the mouth of the Neversink, is a small settlement. This town was settled at an early day by the Dutch and Huguenots, who came from Esopus to the Minisink mines.* The first grant of land in the town was to Arent Schuyler, in 1697, at Maghakaneck, and in the same year another grant was made to Jacob Codeback and others at a place called Waghaghkemick, beginning at the west bounds of lands called Nepeneck. Each of these grants were for 1,000 acres. Henry Cortright settled on the land now occupied by E. Whitlock. Thomas Decker settled where H. Cuddeback now lives; Solomon Davis on a mill-seat now owned by Thomas Van Etten; John Van Fliet where Michael and Solomon Van Fliet now live; James Van Auken on land now owned by J. D. Swartwout; John Westbrook on land now owned by A. J. Cuddeback; Evert Hornbeck on land now occupied by Joseph Cuddeback, and Abraham Van Auken on the place now occupied by D. Swartwout. Many of the names of the old settlers are found in the town.

The total assessed valuation of real and personal property in the town in 1861 was $1,443,314; total taxes, $10,310.71; whole number of acres, 34,356, of which 9,974 are improved. Cash value of farms, $697,764; of stock, $69,594; of implements, $25,574.

Agricultural Statistics for 1861.

Meadow, number of acres, 1,964; hay cut, 2,448 tons; grass seed, 34 bushels. Wheat sown, acres, 297; harvested, 2,140 bushels. Rye sown, acres, 1,495; harvested, 15,672 bushels. Oats sown, acres, 314; harvested, 9,794 bushels. Corn planted, acres, 841; harvested, 24,271 bushels. Buckwheat sown, acres, 513; harvested, 4,917 bushels; potatoes planted, acres, 317; harvested, 27,214 bushels.

Peas, 94 bushels; beans, 129 bushels; turnips, 1,040 bushels; apples, 6,719 bushels; cider, 146 barrels; market gardens, value of products, $2,760; maple sugar, 107 pounds; molasses, 35 gallons; honey, 3,614 pounds; wax, 172 pounds; oxen, 410; cows, 875; other cattle, 709; slaughtered, 107; butter made, 50,964 pounds; milk sold, 86,719 gallons; horses, 394; mules, 8; swine, 914; sheep, 394; fleeces, 387; wool, 1,265 pounds; poultry sold,

* A lead mine has been opened on the west side of the Shawangunk mountain, between Cuddebackville and Port Jervis, on the farm of Gumear's brother, (a descendant of the original settler Peter Gumear,) which is said to be very rich, yielding ore containing 80 per cent. lead and 8 per cent. silver. A company has been formed for working the mine, the stock of which is in great demand, and many farmers in the vicinity are renting their lands for mining operations, expecting great discoveries and results therefrom. In the early settlement of Deerpark we referred to an account of "mine holes" worked by Germans at an early day. Whether this is an extension of the *old mine* near Paaquarry Flats is not certain. It is evident, however, that it promises to be full as rich in extent and resources.

$564; eggs, $772; full cloth made, 192 yards; flannel, 75 yards; linen made, 28 yards; cotton cloth, 46 yards.

Manufactures.

Blacksmith shops, $3,150; machine shops, $125,150; tin and sheet iron, $4,775; bakeries, $24,125; breweries, $5,650; mineral water, $5,140; painting and glazing, $5,275; boat building, $3,250; house building, $15,750; stone quarries, $1,575; coach and wagon, $14,140; grist mills, $134,150; cooper shop, $3,750; saw factory, $26,250; saw mills, $8,750; turning shop, $1,750; brick making, $8,500; lime manufacture, $2,575; plaster mills, $2,700; boots and shoes, $1,550; saddle and harness, $2,425; tanneries, $50,500; cabinet shops, $10,750; printing offices, $8,500; millinery, $5,600; tailoring, $5,575; butcher shops, $24,750; ice houses, $945; tobacco and cigars, $1,500; undertakers, $5,750; mining, $21,500; daguerreotypes, $1,050.

GOSHEN.

Goshen has Wallkill and Hamptonburgh on the north, Blooming Grove on the east; Chester and Warwick on the south, and Wawayunda on the west. The surface is rolling, with some hills capable of cultivation to their tops. In the southwest corner are the drowned lands, which have been partly drained by a ditch cut about three miles in length, called the "outlet." The soil of the valleys is a sandy loam, of the hills gravelly loam; the underlaying rock is slate and limestone. The town is very productive in grain, milk and butter. Several large dairies are kept, of noted excellence. Goshen is the principal village, has county buildings,* two banks, classical schools, female seminary, two newspaper offices, four churches, and about 1,800 inhabitants. Much milk is sent from this town by railroad to New York, and the butter made is renowned throughout the country. The town was first settled by Christopher Denn, in 1712. After him came John Everett, John Carpenter, James Jackson, John Yelverton, John Denton, Samuel Clowes, John Bradner and Samuel Webb. The first inn was kept by Birdseye Yarrington; the first academic school was taught by Noah Webster. Goshen is a half shire town of the county. The total assessed valuation of real and personal property in the town, for 1861, was $1,779,300; total taxes, $14,276.25. Whole number of acres, 23,698, of which 20,854 are improved. Cash value of farms, $1,614,947; of stock, $201,194; of implements, $61,947.

Agricultural Statistics for 1861.

Meadow, number of acres, 7,214; hay cut, 9,162 tons; grass seed, 54 bushels. Wheat sown, acres, 523; harvested, 4,917 bushels. Rye sown, acres, 617; harvested, 10,254 bushels. Oats sown, acres, 897; harvested,

* The old stone court house and jail, which stood fronting the main street, was in partial erection during the war of the revolution. A stone was prepared for the cap of the main front door, with the year of the reign of George III cut thereon, &c. One night this stone was broken through the middle, and rendered unfit for its destination. It was afterwards appropriated to the use of a door stone immediately in front of the main entrance, as an old revolutionary whig said, "so that the people might tread on *king* and *kingly* devices, when they entered their courts of justice." In this building Smith was confined, as connected with the treason of Arnold, but effected his escape therefrom by the aid of sympathising friends and tories.

39,615 bushels. Buckwheat sown, acres, 211; harvested, 1,475 bushels. Corn planted, acres, 1,264; harvested, 36,182 bushels. Potatoes planted, acres, 252; harvested, 25,290 bushels.

Peas, 54 bushels; beans, 67 bushels; turnips, 871 bushels; apples, 2,790 bushels; cider, 114 barrels; grapes, 560 pounds; wine, 150 gallons; honey, 1,517 pounds; wax, 145 pounds; oxen, 184; cows, 3,419; other cattle, 1,017; slaughtered, 420; butter made, 135,619 pounds; milk sold, 1,205,737 gallons; horses, 697; swine, 2,678; sheep, 2,872; fleeces, 2,780; wool, 8,120 pounds; poultry sold, $1,457; eggs sold, $2,644.

Manufactures.

Blacksmith shops, $2,750; tin and sheet iron, $8,125; bakeries, $1,560; chandleries, and soap factory, $1,790; painting and glazing, $1,790; house building, $12,240; sash and blind, $3,580; coach and wagon manufacture, $6,175; grist mills, $21,175; carpenter shop, $2,740; cooper shop, $1,250; turning shops, $1,275; brick manufacture, $7,550; lime manufacture, $1,575; boots and shoes, $5,150; saddle, harness and trunk, $1,250; cabinet shops, $2,750; printing offices, $17,500; millinery, $4,500; tailoring, $4,125; butcher shops, $1,250; undertakers, $3,250.

GREENVILLE.

Greenville is the extreme southwestern town of the county. Its surface is a hilly, broken upland. Along the west borders are the Shawangunk mountains, rising 600 feet above the valleys, and 1,600 feet above tide water. Their eastern slope is gradual, and capable of cultivation to their summit, upon which are some of the finest dairy farms in the county. The Shawangunk kill is the principal stream, and Benin lake the only one; it is in the north part of the town. Much of the soil is gravelly and clayey loam; along the valleys, sandy and gravelly loam; on the mountain, shaly, grits and clay loam, affording fine pasturage. The villages are Greenville, population, 78; Smith's Corners, population, 95. Centre Point is a post office; Woodville in the east part. The town was first settled in 1725 by Moses Kortright, Benjamin Wood, Nicholas Slyter, Soloman Kuykendal, George Quick, Joel Westbrook and Daniel Cole The Shawangunk was formerly called the Alaskayering mountains by the Minsies, who inhabited their base. The total assessed valuation of the real and personal property in the towns for 1861 was $452,941; total taxes, $2,861.86; whole number of acres, 18,204, of which 14,778 are improved. Cash value of farms, $648,375; of stock, $112,264; of implements, $24,947.

Agricultural Products for 1861.

Meadow, number of acres, 3,271; hay cut, 4,719 tons; grass seed, 114 bushels. Wheat sown, acres, 225; harvested, 1,714 bushels. Rye, acres, 827; harvested, 9,116 bushels. Oats, acres, 619; harvested, 19,324 bushels. Buckwheat, acres, 419; harvested, 3,240 bushels. Corn planted, acres, 857; harvested, 17,652 bushels. Potatoes, acres, 104; harvested, 11,314.

Turnips, 720 bushels; apples, 2,875 bushels; cider, 132 barrels; maple sugar made, 710 pounds; molasses, 27 gallons; honey, 915 pounds; wax, 95 pounds; oxen, 54; cows, 2,127; other cattle, 957; cattle slaughtered,

179; butter made, 279,117 pounds; cheese made, 146 pounds; horses, 394; swine, 1,792; sheep, 574; fleeces, 617; wool, 1,715 pounds; poultry sold, $1,164; eggs sold, $1,497; full cloth made, 95 yards; flannel, 229 yards; linen, 46 yards; cotton cloth, 53 yards.

Manufactures.

Blacksmith shops, $1,575; painting and glazing, $1,260; cooper shop, $750; boots and shoes, $1,275; tanneries, $6,500.

HAMPTONBURGH.

Hamptonburgh has Montgomery on the north, New Windsor on the east, Blooming Grove and Goshen on the south, and Wallkill on the west. Its surface is rolling and somewhat hilly. The soil is a gravelly, sandy and slaty loam, productive in wheat, rye, corn and oats. The grasses are fine, and adapted to grazing and dairy purposes. Many of the farmers devote their attention to these pursuits. The Otterkill flows through the town, affording good water power at Campbell Hall and Otterville. There are no villages in the town. Otterkill, sometimes called Deckers, is a small hamlet, first settled by Johannes Decker, who kept a store there. It was previous to this a missionary station, and called "St. David's Corners." A church was erected and called by that name. It was used as a hospital during the revolutionary war, and the burying ground is still seen. Vincent Matthews was an early patron of this church, and after him Jonathan Brooks. Otterville, formerly called Buskirk's Mills, is a small hamlet on the Otterkill, has grist and saw-mill, tavern and store. Campbell Hall, near the center of the town, on the Otterkill, is a small hamlet with a church. Hamptonburgh (Heards) is a small place, known also as "Bullshead," where drovers do congregate and the farmers come to buy stock. This place was first settled by William Bull in 1719, who erected the stone house, still standing, and occupied by one of his descendants. There is another place in town called "Purgatory," by a former resident, Mr. Peter Ball, who lived near by on a sunny knoll. He gave out that "he lived in Paradise, and all who came to his place must pass through the swamp," which he called "Purgatory," and it has retained that name to the present time. The total assessed valuation of real and personal property in the town in 1861 was $790,925; total taxes, $5,297.59; whole number of acres, 16,736, of which 14,520 are improved; cash value of farms, $997,645; of stock, $108,697; of implements, $34,914.

Agricultural Statistics for 1861.

Meadow, number of acres, 4,164; hay cut, 6,742; grass seed, 25 bushels. Wheat sown, acres, 452; harvested, 3,052 bushels. Rye, acres, 674; harvested, 11,240. Oats, acres, 952; harvested, 37,625 bushels. Buckwheat, acres, 78; harvested, 634 bushels. Corn, acres, 929; harvested, 37,314 bushels. Potatoes planted, acres, 98; harvested, 9,217 bushels.

Apples, 3,431 bushels; cider, 92 barrels; grapes, 5,750 pounds; wine, 1,500 gallons; honey, 917 pounds; wax, 94 pounds; oxen, 144; cows, 2,164; other cattle, 697; slaughtered, 159; butter made, 195,640 pounds; milk sold, 124,317 gallons; horses, 464; swine, 2,467; sheep, 2,517; fleeces, 2,524; wool, 6,970 pounds; poultry sold, $1,964; eggs, $2,172.

Manufactures.

Blacksmith shops, $2,750; silverware, $7,500; coach and wagon manufacture, $1,575; grist mills, $1,790; cooper shop, $500; saw-mills, $1,050; boots and shoes, $725; tanneries, $500.

MINISINK.

Minisink has Wawayunda on the northeast, Warwick on the southeast, New Jersey on the southwest, and Greenville on the northwest. Its surface is rolling and hilly; the hills capable of cultivation to their summits. The soil is a gravelly loam, productive in fine grasses suitable for dairy uses. Some fine dairies are kept in this town. Corn, rye, oats and wheat are grown, and, where the soil and cultivation suit, produce good crops. The streams are the Wallkill and Rudger's creek. The drowned lands are in its east angle. The villages are: Unionville in the south part, has two churches, and population 125. West town, three miles further north, has two churches, and population 105. Waterloo Mills is a hamlet, has one church and 42 inhabitants. Rudger's Place, the residence of the late Dr. Merritt H. Cash, is on the west bank of the Rudger's kill, north of Gardnersville. A short distance northeast of Westtown is the tannery of J. D. Gridley, and in the extreme north part of the town, on the Rudger's kill, is Millsburgh, a small settlement. This was formerly one of the largest towns in the county, but by the erection of Mount Hope, Wawayunda and Greenville, it has been shorn of its proportions, and is now one of the smallest. It once contained 56,484 acres. It now contains only 13,831 acres. The total assessed valuation of real and personal estate for the town, in 1861, was $564,323; total taxes, $3,570.44. Whole number of acres, 13,831, of which 11,590 are improved. Cash value of farms $689,450; of stock, $119,654; of implements, $25,344.

Agricultural Statistics for 1861.

Meadow, number of acres, 3,267; hay cut, 4,796 tons; grass seed, 142 bushels. Wheat sown, acres, 296; harvested, 2,041 bushels. Rye sown, acres, 767; harvested, 8,219 bushels. Oats sown, acres, 552; harvested, 19,228 bushels. Buckwheat sown, acres, 314; harvested, 2,419 bushels. Corn planted, acres, 815; harvested, 26,917 bushels. Potatoes planted, acres, 114; harvested, 11,042 bushels.

Beans, 27 bushels; apples, 3,416 bushels; cider, 147 barrels; maple sugar, 654 pounds; molasses, 54 gallons; honey, 3,124 pounds; wax, 217 pounds; oxen, 54; cows, 1,965; other cattle, 917; slaughtered, 159; butter made, 267,944; milk sold, 14,719 gallons; horses, 416; mules 4; swine, 2,560; sheep, 564; fleeces, 562; wool, 1,567 pounds; poultry sold, $1,976; eggs sold, $2,460; full cloth made, 54 yards; flannel made, 178 yards.

Manufactures.

Blacksmith shops, $2,775; carding and cloth dressing, $2,500; painting and glazing, $1,125; coach and wagon manufactures, $6,180; grist mills, $2,750; carpenter shop, $900; cooper shop, $875; saw mills, $1,275; boots and shoes, $2,550; saddle, harness and trunk, $2,750; tanneries, $3,725; cabinet shops, $1,250; chair factories, $1,425; tailoring, $1,250; butcher shops, $1,750; undertakers, $1,250.

MONROE.

Monroe has Cornwall and Blooming Grove on the north, Rockland on the southeast, and Warwick and Chester on the west. This town lies in the midst of the Highlands. Its general surface is mountainous upland. The mountains are steep, precipitous, with rough, rocky and broken summits, and unfit for cultivation. In the valleys are some lands suited for tillage. The soil is composed of the debris and wash from the adjoining mountains; is sandy, shaly, rocky loam. The town contains a great many ponds and lakes, which abound in fine fish. Among these are Mambusha, Slaughter, Cedar, Bull, Poplopen, Duck Cedar and Little Long ponds. The principal streams are the Ramapo, running south; Murderer's creek, running north; the Schunnemunk créek, running north into the latter, and the Forest of Dean creek, which flows into the Hudson at Fort Montgomery. The New York and Erie railroad passes through Monroe, Seamansville, Centreville or Turner's, Wilkes's and Monroe Works—following the Ramapo down into Rockland county—affording easy access to the New York markets. The villages are: Monroe, population, 275; Turner's, sometimes called Centreville, population, 96; Greenwood Works, with a blast furnace, population, 105; Monroe Works, with extensive iron works, formerly in use, population, 87; Highland Mills, with two churches, population, 119. Smith's Clove and Woodbury Clove are small settlements. The town was first settled in 1742, and was then called Cheescocks, from the patent of that name, which comprised the most of the Ramapo valley. The first settlers were Smith, Galloway, Ward, Colton, Nobles, Lamoreaux, Cunningham and Wygants. Ward & Colton erected the first iron works. Nobles & Penn erected the first forge, and cast the first anchor in 1753. Steel was made in 1776, and the chain at West Point was made here; its weight was 186 tons. The manufacture of iron is extensive in this town, and the mines furnish a good quality of ore. The total assessed valuation for the town in 1861 was $1,180,697; total taxes, $7,857.34; whole number of acres, 97,625, of which 25,614 are improved. Cash value of farms, $1,674,956; of stock, $167,290; of implements, $35,678.

Agricultural Statistics for 1861.

Meadow, number of acres, 6,719; hay cut, 8,194 tons; grass seed, 187 bushels. Wheat sown, acres, 106; harvested, 1,179 bushels. Rye sown, acres, 1,040; harvested, 15,674 bushels. Oats sown, acres, 574; harvested, 18,290 bushels. Buckwheat sown, acres, 301; harvested, 2,496 bushels. Corn planted, acres, 1,064; harvested, 41,617 bushels. Potatoes planted, acres, 162; harvested, 14,324 bushels.

Peas, 94 bushels; beans, 114 bushels; turnips, 2,719 bushels; apples, 2,580 bushels; cider, 49 barrels; garden products, $1,764; grapes, 500 pounds; wine, 75 gallons; honey, 1,964 pounds; wax, 148 pounds; oxen, 364; cows, 2,640; other cattle, 1,172; slaughtered, 474; butter made, 115,624 pounds; cheese, 1,140 pounds; milk sold, 526,925 gallons; horses, 564; mules, 38; swine, 1,796; sheep, 970; fleeces, 964; wool, 2,840 pounds; poultry sold, $1,465; eggs, $1,872; full cloth made, 38 yards; flannel, 149 yards.

Manufactures.

Blacksmith shops, $4,575; iron manufactures, $247,964; silver ware, $4,500; tin and sheet iron, $2,125; coach and wagon manufacture, $12,120; grist mills, $78,140; cooper shop, $625; plaster mills, $1,500; boots and shoes, $1,250; saddle, harness and trunk, $2,550; tanneries, $31,750; butcher shops, $1,750; mining, $82,450.

MONTGOMERY.

Montgomery is bounded by the county line on the north, Newburgh on the east, New Windsor and Hamptonburgh on the south, and Crawford and Wallkill on the west. Its surface is some rolling, and slightly hilly. The Comfort hills rise from 600 to 800 feet above tide water, and lie along the west borders of the town. The soil is a rich, gravelly and sandy loam, very productive in corn, oats, barley, wheat and rye, and produces fine grass and hay. The farms of this town are well tilled, and are very productive—the farmers generally thriving and independent. There is some swamp land along the Wallkill above Montgomery. The Wallkill is the principal stream. The Tin brook enters it near Walden. The villages are: Montgomery, on the Wallkill, has three grist mills, saw mill, two churches and a population of 784. Walden, on the Wallkill, has a shawl factory, satinet factory, cotton factory, a manufacture of cutlery, grist mills and a population of 674. St. Andrews has a population of 70. Coldenham is a small settlement near the east line of the town. This place was named after Cadwallader Colden, an early settler. Henry Wileman was the first patentee, who settled in the town near where Walden now stands. Johannes Miller settled on the Wallkill in 1727. After them came John Neely, Charles Booth, William Eager and Johannes Youngblood. The first store was kept by Alexander Colden. The first grist mill at Walden was built by James Kidd. This town originally belonged to the precinct of Wallkill. When set off it was called the precinct of Hanover, which name it retained until 1788. In 1767 the tax for the whole precinct of the Wallkill was £168 14s. 11d. 3⅔f. In 1768 the supervisor was Major Colden; clerk, John Miller, and assessors, Patrick Barber and James White. In 1776 it was voted that *"a pair of stocks* be set up between the Widow Crist's and the Wallkill bridge, expenses to be paid out of the poor money." In 1794 "Martinas Crist and John Smith freed their slaves, and gave surety against their being chargeable." The total assessed valuation for the town in 1861 was $1,727,255; total of taxes, $10,678.89; whole number of acres, 30,552, of which 25,497 are improved. Cash value of farms, $1,987,644.44; of stock, $249,384; of implements, $87,465.

Agricultural Statistics for 1861.

Meadow, number of acres, 5,814; hay cut, 8,614 tons; grass seed, 44 bushels. Wheat sown, acres, 697; harvested, 8,314 bushels. Rye sown, acres, 2,319; harvested, 32,518 bushels. Oats sown, acres, 2,124; harvested, 62,674 bushels. Buckwheat sown, acres, 275; harvested, 2,640 bushels. Corn planted, acres, 2,579; harvested, 58,734 bushels. Potatoes planted, acres, 273; harvested, 23,957 bushels.

Peas, 117 bushels; beans, 39 bushels; turnips, 1,654 bushels; apples,

14,719 bushels; cider, 716 barrels; market garden, $98; maple sugar, 117 pounds; wine made, 80 gallons; honey, 574 pounds; wax, 123 pounds; oxen, 254; cows, 2,864; other cattle, 976; slaughtered, 352; butter made, 356,594 pounds; milk sold, 8,817 gallons; horses, 793; swine, 5,794; sheep, 3,140; fleeces, 3,032; wool, 10,270 pounds; poultry sold, $3,572; eggs, $5,290; full cloth, 174 yards; flannel, 87 yards.

Manufactures.

Cider mills, $1,050; grain cradles, $115; blacksmiths, $4,250; tin and sheet iron, $1,575; cotton factories, $45,775; woolen cloth and yarn, $137,940; distilleries, $3,125; match manufactory, $12,140; coach and wagons, $2,575; grist mills, $144,540; cooper shop, $2,550; saw mills, $165,250; turning shops, $1,450; boots and shoes, $1,275; saddle, harness and trunk, $1,450; tanneries, $1,550; cabinet shops, $1,250; printing offices, $6,250; millinery, $1,250; tailoring, $1,175; butcher shops, $1,275; tobacco and cigars, $24,550; undertakers, $2,740.

MOUNT HOPE.

Mount Hope lies between Wallkill and Deerpark. This town was erected in 1825 by the name of Calhoun, but the "nullification" ideas of that politician induced the people to abandon the name, and adopt that of Mount Hope, as a harbinger of better things than nullification and secession. The surface of this town is a broken and hilly upland. The soil is a gravelly and sandy loam, productive in corn, rye, oats and grasses. The grasses are fine for milk and butter, of which fine qualities are sent to New York. The streams are the Shawangunk and Little Shawangunk, which flow northeast. Otisville is nestled under the Shawangunk mountains, and has a population of 327. Mount Hope, two miles southeast of Otisville, has two churches and 125 inhabitants. New Vernon, in the north part of the town, has a church and 98 inhabitants. Finchville, in the southwest part, is a small settlement made by James Finch previous to the revolution. He was a soldier in the French war, and a "minute man" during the revolution. Benjamin Woodward was in business some time at Mount Hope; also Benjamin Dodge and Stephen St. John were enterprising business men of the place. The New York and Erie railroad passes through Otisville, leaving Mount Hope village a mile to the right, as it turns northeast towards Howell's depot This opens up an easy thoroughfare to the seaboard, and brings the town within three hours of New York city. This town, together with Deerpark, up to the revolutionary war, was designated as in the "Mamacoting precinct," which extended from Rochester, in Ulster county, down to Carpenter's Point, then called Minisink. It is creditable to the citizens of this entire district that they unanimously signed the "revolutionary pledge." Among those who signed we find many names of both towns, as Swartwouts, Cooks, Van Inwegens, Cuddebacks, Finch, De Pue, Rose, Shaver, Gumore, Halcomb, Smedes and Drake. The total assessed valuation for the town, in 1861, was $589,207; total taxes, $4,068.26. Whole number of acres in the town, 15,707, of which 12,178 are improved. Cash value of farms, $735,154; of stock, $98,346; of implements, $32,659.

Agricultural Statistics for 1861.

Meadow, number of acres, 8,187; hay cut, 4,995 tons; grass seed, 54 bushels. Wheat sown, acres, 298; harvested, 1,374 bushels. Rye sown, acres, 769; harvested, 8,987 bushels. Oats sown, acres, 611; harvested, 18,340 bushels. Buckwheat sown, acres, 294; harvested, 1,734 bushels. Corn planted, acres, 855; harvested, 29,340 bushels. Potatoes planted, acres, 78; harvested, 6,954 bushels.

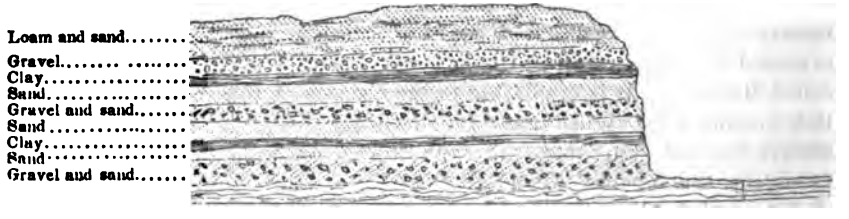
Peas, 78 bushels; beans, 59 bushels; turnips, 973 bushels; apples, 1,479 bushels; cider, 127 barrels; maple sugar, 238 pounds; molasses, 44 gallons; honey, 1,795 pounds; wax, 195 pounds; oxen, 48; cows, 1,798; other cattle, 593; slaughtered, 216; butter made, 158,317 pounds; milk sold, 574,916 gallons; horses, 396; mules, 4; swine, 1,278; sheep, 519; fleeces, 517; wool, 1,627 pounds; poultry sold, $1,464; eggs sold, $1,972; full cloth, 49 yards; flannel, 154 yards.

Manufactures.

Cider mills, $150; fanning mills, $1,500; blacksmiths, $5,125; woolen cloth and yarn, $5,750; coach and wagons, $3,525; grist mills, $25,150; cooper shop, $1,250; saw mills, $2,775; boots and shoes, $1,475; saddle, harness and trunk, $1,250; printing offices, $2,125; tailoring, $1,250; butcher shops, $1,025.

NEWBURGH.

Newburgh is the extreme northeastern town of the county. Its surface is generally hilly and broken. Some of the hills rise from 500 to 850 feet above the river. Along the river are a series of bluffs from 150 to 300 feet in height. The hills are generally capable of cultivation. The soil is clay, gravelly and sandy loam, producing fine corn, oats, rye, wheat and good pasture. Back of the northwest part of the village, one mile, are extensive marl and peat beds, and beyond these is the limestone ridge, which extends northeast and southwest several miles. Towards the Orange lake the land is full of ridges, boulders and loose, broken stone to Rocky Forest, which is rocky enough. West of the new mills, the soil is also stony and rocky to the Quassaic creek, beyond that it is rolled up into a succession of hills, running northeast and southwest. These afford fine pastures and good crops of grain. The south part of the town, bordering on the river, is divided into high bluffs of rich soil, producing some of the finest crops in the town. Under the soil are a succession of layers of clay, sand, gravel, &c.



This bluff, between Newburgh and the Quassaic creek, furnishes an inexhaustible supply of fine building sand and gravel. The proprietor sells it by the carman load to those in want. The creeks are the Quassaic, Foster-

town, Gidney and Bushfield. Orange lake in the western part, out of which runs the Quassaic. The hills are the Limestone, Racoon, Kings and Belknap. Newburgh is the principal village. It is situated upon the steep slope of the western shore of the river; population, 10,467. It is a half shire town of the county. Has a court house, fourteen churches, three banks, a collegiate institute, academy, union school and several private and select schools. The village is supplied with water from the Little pond, three miles distant, by the Newburgh water works, at a cost of $115,448. A steam ferry runs between Newburgh and Fishkill landing every hour. In the village are large manufactures of printing cloths, castings, machinery, beer, &c. Among them are three foundries, giving employment to 145 men, and manufacturing work to the amount of $175,000 annually; a cotton factory and steam printing cloth factory, employing 350 hands and producing $250,000 worth of goods per annum; a brewery, employing thirty-eight hands, and producing 40,000 barrels of beer per annum; an agricultural implement factory; a car factory; a car wheel factory; a piano forte factory; a soap and candle factory; a machine shop; boiler works; a barrel manufactory, producing annually an amount of $275,000; also three coach makers; three bookbinderies; two printing offices; two Morocco factories; one tannery; one potter; two stone cutters; two glove makers and leather dressers; fifteen cordwainers; three hatters; five tailors; six milliners; four bakers; two chair makers; one reed maker; one comb factory; three silversmiths; four watchmakers; one gunsmith; two tobacconists; two painters; two paper hangers; two druggists. Several packets ply regularly to New York; also the river steamboats, and four barges carrying produce and marketing the same. Shipping to the amount of 4,000 tons is owned in the village. The lumber trade is large, amounting to over 24,000,000 feet, and more than 35,000 bunches of shingles per annum. Packets ply regularly between Newburgh and Albany, stopping at the intermediate landings. A large quantity of brick is made in the immediate neighborhood of the village, giving employment to many persons, and a carrying trade to a number of vessels; the quartenary deposits, above and below the village, furnishing an inexhaustible supply of material. The limestone rock, in the rear, is a source of profit in the manufacture of lime, which is carried on to a considerable extent. The nursery business is largely conducted under the auspices of Charles Downing, Esq., and the successors of A. Saul, deceased.

The environs of Newburgh are more highly cultivated than those of any other in the county. There are here whole rural neighborhoods of beautiful residences, the surrounding grounds of which are tastefully laid out and planted. The seat of Mr. Alger (formerly the residence of the late A. J. Downing) is surrounded by a lawn abounding in fine trees artistically disposed. The style of the building, the perfect order of the grounds, the beauty of the walks, the rare plants and shrubs, the perfect harmony and keeping of the whole, all combine to make it a rare gem of artistic beauty. The whole neighborhood through Grand and Liberty streets, to Balmville, presents a continuous succession of rural seats, amid landscape gardens, clothed with a profusion of trees and shrubbery, all in perfect order and

keeping. There are more rural scenes here for the lover of the picturesque and the beautiful, than are usually found in so small a compass.

Another object of interest in the vicinity of Newburgh is the old Hasbrouck house, "Washington's headquarters" while the army of the revolution were encamped in the vicinity. It was purchased by the State in 1850, and is kept open to public examination. The rooms are filled with the relics of the revolution, of the war of 1812, and of the Mexican war. There are to be seen original letters of Washington, La Fayette, Clinton and others; also the tables used by Washington, La Fayette, Koskiusko and Putnam; links from the chain used to impede the navigation of the river at West Point; and near the northeast corner of the building the grave of Urial Knapp, the last of Washington's life guards, who died in 1856.

The old glebe school house, which stood on the east side of Liberty street, in the old town, was, until its removal, an object of considerable interest. It was the first house in which a school was taught in Newburgh, and Mr. Hutchins, the almanac maker, lived in it formerly, and kept a school. We make record of the fact to perpetuate its remembrance.

Middle Hope, in the northeast part of the town; population 84. Fostertown, four miles northwest of Newburgh; population 70. Gardnertown, on the Orange lake; population 75. Balmville, two miles north of Newburgh, is a small settlement, named after a large tree growing in the vicinity. This Balm of Gilead tree is about 110 years old; it is about 20 feet in circumference, and the branches cover a circumference of near 300 feet. It is a majestic tree.

There is a large plane or buttonwood tree on the north side of the Newburgh and Cochecton turnpike, before the residence of N. Brewster, which grew up from a handspike stuck into the ground. It is a large, beautiful tree, with a large branch shooting out in a horizontal direction, and the main trunk ascending in a regular, stately and uninterrupted manner. The Coldenham post-office is kept not far from this place. Savil is a post-office about five miles northwest of Newburgh. Rossville is a small hamlet, eight miles northwest of Newburgh, named from Alexander Ross, the first settler there. New Mills, one mile west of Newburgh—a flouring and plaster mill, and a small village. Hampton is a landing on the Hudson, six miles north of Newburgh, with a ferry to Hamburgh on the opposite shore. On the banks above this landing are seen growing beautiful cedars and arbor vitæs, many of them being perfect cones in outline, and much more symmetrical and perfect in growth than are generally seen.

Daus Kammer is a high promontory jutting out into the Hudson not far from the north line of the town. It is said that when Hudson sailed up the river, Indians were seen dancing, by fire-light, on this point, and they appeared so weird and frightful, that the crew exclaimed, "de duyfels daus kammer," and the name has attached to the present day.

Among those who signed the revolutionary pledge, we find the following names, that are known in the town, viz: Hasbrouck, Belknap, Robinson, Clark, Birdsall, Waugh, Higby, Buckingham, Wood, Smith, Case, Carpenter, Lockwood, Gardner, Albertson, Wygant, Fowler, Duboise, Goldsmith and Weed. In this connection we note that Gen. Wm. G. Belknap, who distinguished himself in the war of 1812, at Fort Erie, and in the Mexican

war at Palo Alto and Resaca de la Palma, was a resident of Newburgh, and a branch of the patriotic old Belknap family of that place.

The whole number of acres in the town is 29,332, of which 25,245 are improved. Cash value of farms, $2,194,648; of stock, $248,964; of implements, $74,875. In the year 1861, the total assessed valuation of real and personal property was $6,559,870; total taxes, $45,671.68.

Agricultural Statistics for 1861.

Meadow, number of acres, 5,872; hay cut, 8,164 tons; grass seed, 34 bushels. Wheat sown, acres, 516; harvested, 4,879 bushels. Rye sown, acres, 2,164; harvested, 33,791 bushels. Oats sown, acres, 1,979; harvested, 59,345 bushels. Buckwheat, acres sown, 517; harvested, 5,942 bushels. Corn planted, acres, 1,975; harvested, 54,867 bushels. Potatoes planted, acres, 365; harvested, 32,917 bushels. Peas, 195 bushels; beans, 123 bushels; turnips, 3,740 bushels; tobacco, 1,564 pounds; apples, 7,194 bushels; cider, 878 barrels; market gardens, $2,850; grapes, 5,950 pounds; wine, 1,400 gallons; honey, 3,134 pounds; wax, 472 pounds; oxen, 374; cows, 2,587; other cattle, 863; slaughtered, 2,694; butter made, 234,917 pounds; milk sold, 447,560 gallons; horses, 1,272; mules, 18; swine, 4,170; sheep, 1,047; fleeces, 1,052; wool, 3,790 pounds; poultry sold, $4,719; eggs, $4,340; full cloth, 278 yards.

Manufactures.

Agricultural implements, $17,500; blacksmiths' shops, $9,575; furnaces, $175,625; tin and sheet iron, $25,250; cotton factories, $328,764; shoddy mill, $1,200; woolen cloth and yarn, $20,670; bakeries, $25,250; breweries, $181,750; chandleries and soap factories, $155,570; confectionery, $3,190; distilleries, $10,640; gas manufactory, $12,275; oil-cloth manufacture, $25,575; painting and glazing, $23,260; steam engine manufacture, $37,500; ship building, $58,340; house building, $17,640; sash and blind factory, $7,175; coach and wagons, $7,190; pump manufacture, $5,190; grist mills, $164,370; carpenters' shops, $27,140; cooper's shop, $6,250; saw mills, $210,125; turning shops, $2,750; brick manufacture, $75,275; lime manufacture, $4,525; plaster mills, $9,750; stone cutting, $5,150; boots and shoes, $12,740; saddle, harness and trunk, $27,750; morocco manufacture, $35,500; tanneries, $69,125; brush manufacture, $3,575; cabinet shops, $24,750; chair factory, $1,725; house furnishing, $22,150; piano forte manufacture, $24,500; printing offices, $25,500; gunsmith, $500; dentistry, $2,500; millinery, $22,150; hat and cap, $12,150; tailoring, $21,550; butcher shops, $28,650; ice houses, $750; tobacco and cigars, $15,275; undertakers, $15,675; barrel manufacture, $27,600; car and car wheel manufacture, $21,650; daguerreotypes, $2,500.

NEW WINDSOR.

New Windsor lies south of Newburgh, and north of Cornwall. The surface is rolling and hilly, and cultivated to the hill tops. Snake hill rises 600 feet above the river. The principal creeks are the Murderer's and Tin brook. Little pond is in the north part, and 230 feet above tide. The soil in the eastern part of the town is a clayey, gravelly loam, filled with

boulders and stones; in the west part, slaty and gravelly. The soil is adapted to grazing, and some fine dairies are kept. The products are rye, wheat, corn, oats, hay, butter and milk. This town was formerly described as in the "precinct of the Highlands." The principal village is New Windsor, on the Hudson, the oldest village in the county; has two churches, and about 480 population; has a long dock for steamboats to land. Large quantities of brick are made near by. There was formerly a glass house in the north part. Considerable business was heretofore done at this place by Isaac Shultz and Thomas Ellison. Moodna contains a cotton factory, paper mill, and population of 65. It was formerly known as Orangeville. Mortonville has one church, grist mill, and 42 inhabitants. It is commonly called "Vail's Gate." Little Britain is near the center, and is a sparsely settled neighborhood; one church. The first settlers here were the Clintons, Dennistons, McLaughreys and Youngs. Washington Square was named by the revolutionary soldiers encamped near by. It is a small hamlet where the roads form four corners. Stonefield is a farm named by Rev. John Moffatt, its former occupant, who kept a grammar school, at which De Witt Clinton and General James Wilkin attended. Part of the farm was occupied by the late James Roberts, and part by the heirs of Mrs. John J. Brooks, deceased. Rock Tavern, in the west part of the town, named from the rocks on which the building stands and is surrounded, and a tavern being kept therein. It has been for years occupied for this purpose, and was a general resort on training days, elections and other public purposes. Assessed valuation for the town, in 1861, was $1,259,865; taxes, $8,098.19. Whole number of acres in the town, 21,346, of which 17,584 are improved. Cash value of farms, $1,554,279; of stock, $174,897; of implements, $45,249.

Agricultural Statistics for 1861.

Meadow, number of acres, 5,124; hay cut, 7,987 tons; grass seed, 27 bushels. Wheat sown, acres, 479; harvested, 3,964 bushels. Rye sown, acres, 1,347; harvested, 17,320 bushels. Oats sown, acres, 1,075; harvested, 29,652 bushels. Buckwheat sown, acres, 254; harvested, 1,739 bushels. Corn planted, acres, 1,463; harvested, 39,613 bushels. Potatoes planted, acres, 158; harvested, 11,594 bushels.

Peas, 95 bushels; beans, 25 bushels; turnips, 2,750 bushels; tobacco, 947 pounds; apples, 5,876 bushels; cider, 172 barrels; market gardens, $3,594; honey, 2,974 pounds; wax, 214 pounds; oxen, 274; cows, 2,478; other cattle, 874; slaughtered, 317; butter made, 233,917 pounds; milk sold, 254,192 gallons; horses, 587; swine, 3,567; sheep, 1,278; fleeces, 2,472; wool, 3,871 pounds; poultry sold, $2,978; eggs sold, $3,379.

Manufactures.

Blacksmithing, $3,725; machine shops, $25,275; cotton factories, $45,275; paper mills, $125,150; twine and net manufactures, $17,150; coach and wagons, $1,250; cooper shop, $575; saw mills, $550; brick manufacture, $38,500; boots and shoes, $1,750; daguerreotype case manufacture, $25,550; butcher shops, $1,250.

WALLKILL.

Wallkill has Crawford and Montgomery on the northeast, Hamptonburgh on the southeast, Goshen and Wawayunda on the south, Deerpark on the west and Sullivan county on the northwest. Its surface is hilly, broken upland. The soil is a clayey, gravelly loam, very productive in fine grasses, and producing good crops of corn, oats, rye and wheat. A large quantity of milk is sent from this town to New York—nearly 3,000 gallons per day. The butter dairies of the town are large and profitable. The streams are the Wallkill, Shawangunk kill, Mohagen creek and McCorlin's kill, which enters the Wallkill a mile and half above Stony Ford bridge. Middletown is the second largest village in the county. It is in the south part of the town, near the Mohagen creek, and is an important station on the New York and Erie railroad. It contains seven churches, an academy, several private select schools, two banks, two printing offices, a carpet bag factory, file factory, grain cradle factory, hat factory, sash and blind factory, foundry and machine shop, employing altogether over 325 hands and turning out goods to near half a million of dollars annually. Mechanictown has a woolen factory and about 125 inhabitants. Circleville has two churches and a population of 105. Howell's Depot, a station on the railroad, has a population of 98. Scotchtown has one church and a population of 125. This place is on a high ridge, and overlooks a large extent of country. The Rev. Methusaleh Baldwin formerly preached here. Phillipsburgh and Rockville are small hamlets. Manufactures to some extent were formerly carried on at Phillipsburgh. Michigan is a small hamlet. Van Beurenville is a small village in the western part. Millsburgh is a small hamlet northeast of Scotchtown. Honey Pot, a settlement in the central part of the town, where the blacks, emancipated by the will of Col. McLaughrey, bought farms and settled. The farmers of the town of Wallkill are generally enterprising and prosperous. Their farms are well tilled, and their crops large and productive. The total assessed valuation for the town in 1861 was $2,444,337; total of taxes, $16,182.16; whole number of acres, 40,272. Total value of farms, $1,999,050; number of improved acres, 34,398; value of stock, $284,544; of implements, $96,798.

Agricultural Statistics for 1861.

Meadow, number of acres, 10,442; hay cut, 15,679 tons; grass seed, 94 bushels. Wheat sown, acres, 974; harvested, 9,873 bushels. Rye sown, acres, 1,497; harvested, 23,314 bushels. Oats sown, acres, 1,994; harvested, 59,789 bushels. Buckwheat sown, acres, 519; harvested, 4,687 bushels. Corn planted, acres, 2,172; harvested, 64,495 bushels. Potatoes planted, acres, 214; harvested, 19,514 bushels.

Peas, 54 bushels; beans, 37 bushels; turnips, 695 bushels; hops, 48 pounds; apples, 19,674 bushels; cider, 487 barrels; maple sugar, 297 pounds; molasses, 46 gallons; wine, 75 gallons; honey, 2,587 pounds; wax, 374 pounds; oxen, 268; cows, 3,279; other cattle, 1,472; slaughtered, 397; butter made, 378,917 pounds; milk sold, 714,340 gallons; horses, 944; mules, 4; swine, 4,142; sheep, 1,694; fleeces, 1,710; wool, 5,217 pounds; poultry sold, $4,172; eggs, $4,790; full cloth made, 148 yards; flannel, 340 yards; linen, 59 yards; cotton, 48 yards.

Manufactures.

Agricultural implements, $7,250; grain cradles, $5,250; blacksmiths, $6,775; file factory, $3,750; foundry and machine shops, $125,000; tin and sheet iron, $25,675; carding and cloth dressing, $2,750; woolen cloth and yarn, $9,750; bakeries, $2,750; distilleries, $6,750; match manufactory, $17,140; painting and glazing, $15,175; house building, $7,290; sash and blind, $6,450; coach and wagons, $5,190; grist mills, $27,290; carpenter shops, $31,600; cooper shop, $1,425; rule factory, $3,000; saw factory, $50,175; saw mills, $20,450; turning shops, $1,525; brick manufacture, $11,550; plaster mills, $1,750; stone cutting, $1,780; boots and shoes, $6,250; saddle, harness and trunk, $1,825; tanneries, $22,360; cabinet shops, $7,500; printing offices, $15,175; hats and caps, $38,500; millinery, $15,750; tailoring, $56,750; butcher shops, $18,750; carpet bags, $125,500; tobacco and cigars, $12,500; undertakers, $10,550; daguerreotypes, $1,500.

WARWICK.

Warwick is the extreme southern town of the county, west of Monroe. The south and east parts of the town are mountainous, the north and west hilly and broken. In the south the mountains are the Sterling, Warwick and Rough; in the east the Belleville mountains. In the west part are the drowned lands, and Pine, Merritt, Black Walnut, Gardner's, Cranberry and Fox islands, and adjoining the drowned lands is Pochuck mountain in the south, and Mount Adam and Eve in the north. The soil is a sandy and gravelly loam in the valleys, very productive in cereal crops and grasses. The mountains are unfit for cultivation, the soil being thin and poor. The mountains are rich in ores and minerals. The streams are the Wallkill, Quaker, Wawayunda, Longhouse and Pochuck creeks. Greenwood lake, (called Long pond) Sterling, Wickham and Thompson's ponds are in the town. Warwick, a village on the Wawayunda creek, has three churches, the Warwick institute, and 359 inhabitants. Florida has three churches, the Seward seminary, and 315 inhabitants. Amity has 164 population. New Milford, 125 population. Bellvale, 195 population. Edenville, 116 population. Dutch Hollow, 98 population. In the extreme south part of the town are the Sterling works, named from the iron works located on the outlet of the pond, where iron has been manufactured over 100 years. The works were named after General William Alexander, Lord Sterling, who had an interest in the works. Steel and anchors were manufactured here during the revolution, and the works continue to turn out from fifteen to eighteen tons of pig iron per day. The mines in the vicinity of the works are very rich and productive, the ore of good quality. The first settlement was made by Benjamin Burt, Thomas Welling, and Daniel Whitney. The first mill was built by David Burt, at Bellvale, in 1760. Francis Baird opened the first inn, and Daniel Burt the first store. The total assessed valuation for the town, in 1861, was $1,891,818; total taxes, $12,101.20. Whole number of acres, 51,104, of which 36,004 are improved. Cash value of farms, $2,473,238; of stock, $335,676; of implements, $79,928.

Agricultural Statistics for 1861.

Meadow, number of acres, 9,472; hay cut, 14,340 tons; grass seed, 1,240 bushels. Wheat sown, acres, 1,246; harvested, 9,764 bushels. Rye

sown, acres, 2,394; harvested, 31,452 bushels. Oats sown, acres, 1,852; harvested, 59,762 bushels. Buckwheat sown, acres, 587; harvested, 4,394 bushels. Corn planted, acres, 2,492; harvested, 67,327 bushels. Potatoes planted, acres, 197; harvested, 14,394 bushels.

Peas, 52 bushels; beans, 79 bushels; turnips, 414 bushels; apples, 5,719 bushels; cider, 146 barrels; market gardens, $279; maple sugar, 494 pounds; molasses, 25 gallons; honey, 4,679 pounds; wax, 347 pounds; oxen, 534; cows, 5,379; other cattle, 2,784; slaughtered, 419; butter made, 429,574 pounds; cheese, 98,096 pounds; milk sold, 379,672 gallons; horses, 1,272; mules, 19; swine, 6,719; sheep, 2,644; fleeces, 2,792; wool, 8,154 pounds; poultry sold, $3,967; eggs sold, $4,592; full cloth, 69 yards; flannel, 210 yards; linen, 49 yards; cotton, 71 yards.

Manufactures.

Cider mills, $250; blacksmith shops, $3,525; iron manufactories, $175,525; tin and sheet iron, $3,780; woolen cloth and yarn, $2,175; painting and glazing, $2,570; house building, $1,270; coach and wagons, $5,150; grist mills, $23,150; cooper shop, $1,250; saw mills, $1,550; lime manufacture, $2,575; plaster mills, $1,525; boots and shoes, $4,125; saddle, harness and trunk, $1,040; tanneries, $15,972; cabinet shops, $2,575; piano forte manufacture, $4,750; millinery, $3,225; tailoring, $1,250; butcher shops, $3,250; undertakers, $1,750; mining, $27,190.

WAWAYUNDA.

Wawayunda lies between Goshen and Minisink, with Wallkill on the north and Warwick on the south. Its surface is rolling and hilly. The soil is a clay and sandy loam, in some places slaty loam; is generally well adapted to pasturage, and furnishes good milk and butter. The milk sent to New York daily is said to amount to 1,500 gallons; and the butter is very fine. The drowned lands are in the southeast corner of the town. The streams are the Wallkill, Rudger's and Mohagan. Joe Gee hill is a high eminence northwest of Slate hill. It is in some parts steep, but not rocky, and is capable of being cultivated. The base and lands around it are sandy loam. A tribe of Indians formerly resided here, the last of whom was Joe Gee, who lived on the hill. Many relics of Indian implements have been found here. Slate Hill has one church and 150 inhabitants. Ridgebury has two churches and a population of 210. Here for a long time lived Gen. Benjamin Dunning, a man of worth, probity and usefulness. New Hampton, on the Wallkill, a railroad station, has a population of 143. Denton, one mile south, at the Outlet bridge, has a population of 180. Centreville, on the west bank of the Rudger's kill, has a population of 96. Millsburgh has a grist and saw mill and a population of 94. Gardnerville has a grist and saw mill and a population of 92. Dolsantown is a hamlet first settled by Isaac Dolsan previous to 1756. The lands here are very fine and productive. A block house was erected as a protection against the Indians, many of whom resided, and had their burying ground here. The products of Wawayunda will compare with those of any town in the county. It is strictly agricultural. The citizens, devoting their attention to the improvement of the farms, are advancing in wealth

and in the means for its acquisition. There can be no better example of the independent farmer than is found in the town of Wawayunda. The total assessed valuation for the town in 1861 was $864,429; total taxes, $5,454.31; whole number of acres in the town, 19,449, of which 17,145 are improved. Cash value of farms, $991,530; of stock, $115,512; of implements, $18,722.

Agricultural Statistics for 1861.

Meadow, number of acres, 4,719; hay cut, 7,214 tons; grass seed, 19 bushels. Wheat sown, acres, 247; harvested, 2,319 bushels. Rye sown, acres, 595; harvested, 8,426 bushels. Oats sown, acres, 652; harvested, 19,253 bushels. Buckwheat sown, acres, 310; harvested, 2,790 bushels. Corn planted, acres, 917; harvested, 36,254 bushels. Potatoes planted, acres, 95; harvested, 9,722 bushels.

Peas, 79 bushels; beans, 63 bushels; turnips, 419 bushels; apples, 1,784 bushels; cider, 59 barrels; wine made, 29 gallons; oxen, 94; cows, 3,071; other cattle, 817; slaughtered, 310; butter made, 264,580 pounds; milk sold, 394,214 gallons; horses, 462; swine, 2,784; sheep, 617; fleeces, 624; wool, 2,150 pounds; poultry sold, $1,791; eggs, $2,317; flannel made, 78 yards; linen, 37 yards.

Manufactures.

Blacksmith shops, $2,560; tin and sheet iron, $1,450; woolen cloth and yarn, $16,564; coach and wagons, $1,725; grist mills, $2,750; cooper shop, $750; saw mills, $1,450; boots and shoes, $875; cabinet ware, $1,240; millinery, $1,240; tailoring, $1,250; butcher shops, $750; undertakers, $1,274.

Total Agricultural Statistics of the County.

Hay, 126,259 tons; wheat, 68,216 bushels; rye, 264,050 bushels; oats, 539,141 bushels; corn, 622,279 bushels; buckwheat, 40,798 bushels; potatoes, 348,129 bushels; peas, 1,169 bushels; beans, 973 bushels; turnips, 23,323 bushels; apples, 92,480 bushels; cider, 3,870 barrels; honey, 27,932 pounds; wax, 2,763 pounds; grapes, 24,860 pounds; wine, 7,059 gallons; oxen, 3,984; cows, 42,869; other cattle, 16,223; butchered, 7,161; butter made, 3,507,304 pounds; cheese made, 99,372 pounds; milk sold, 6,272,872 gallons; horses, 10,512; mules, 113; swine, 48,569; sheep, 24,172; wool, 75,110 pounds; poultry sold, $39,348; eggs, $47,645. Domestic manufactures—Full cloth, 1,312 yards; flannel, 1,973 yards; linen, 803 yards; cotton cloth, 218 yards.

Grand total valuation in money, $7,808,670.16.

Manufactures.

Agricultural implements, $24,750; cider mills, $2,490; fanning mills, $1,500; grain cradles, $5,400; files, $3,750; silver ware, $12,000; machinery, $150,425; carding and cloth dressing, $6,725; blacksmithing, $63,185; furnaces, $300,625; iron manufactures, $423,489; tin and sheet iron, $79,255; cotton manufactures, $450,664; paper mills, $156,495; shoddy, $12,000; twine and net, $17,150; bakeries, $53,685; chandlery and soap, $157,360; woolen cloths, $195,574; confectionery, $3,190; distilleries, $20,515; gas manufacture, $12,275; oil cloth, $25,575; matches, $29,280; breweries, $187,400; mineral waters, $5,140; painting and glas-

ing, $53,440; steam engines, $37,500; ship building, 58,340; boat building, $3,250; stone quarries, $20,115; pump manufacture, $5,190; spokes, $2,550; rules, $3,000; turning shops, $8,750; sash and blinds, $17,205; house building, $54,190; carpenter shops; $62,380; saw factories, $76,425; daguerreotype cases, $25,550; daguerreotypes, &c., $4,050; coach and wagons, $80,195; grist mills, $720,285; brick making, $176,875; lime manufacture, $11,250; boots and shoes, $54,665; saddles, harness and trunks, $45,865; morocco, $35,500; cooper shops, $24,830; saw mills, $417,040; plaster mills, $17,225; tanneries, $218,592; stone cutting, $6,930; cabinet shops, $78,215; chair factories, $3,725; house furnishing, $22,150; brush manufacture, $3,525; piano forte, $32,400; gunsmith, $500; dentistry, $2,500; butcher shops, $88,700; printing, $75,050; carpet bags, $125,500; tobacconists, $53,775; barrel manufacture, $29,050; mining, $81,140; hat and cap, $40,650; millinery, $53,715; tailoring, $118,315; ice houses, $1,735; car and car wheels, $21,650; undertakers, $42,169.

Total value of agricultural products and stock at the market price, for the year 1861, $7,808,670.16. Total value of manufactures for same year, $5,511,816.60. Aggregate productive industry of the county for the year 1861, $13,320,486.76.

THE ASSOCIATED DAIRIES AND CHEESE MANUFACTORIES OF NEW YORK.

BY X. A. WILLARD, A. M., OF LITTLE FALLS, N. Y.

The application of associated labor, in connection with the dairy, is engaging the attention of farmers in Herkimer, Oneida, Cortland, Jefferson, Lewis, Otsego, and other cheese-producing counties of the State. The advantages of association in the conduct and management of manufactures and of arts, lying in those channels where associated capital has been employed, are pretty generally understood and appreciated by the public; but the farmer has, for the most part, supposed his business to be of a character that would not easily adapt itself to this principle. He has therefore been content to limit his efforts to the production of the raw material—growing his wheat, his wool, his flax, together with other products of the soil, and disposing of his surplus, as best he could, to be manufactured and marketed by associated capital and labor. It is not proposed, just here, to discuss the question of economy, on the part of the farmer, in this arrangement. The manufacture of some of his staple products might perhaps require too much capital, and be surrounded by a complicated system of management demanding financial skill and executive ability of an order not easily secured; involving, too, more hazard than is congenial to those used only to farm life; yet there are others of a character so readily fitted for market, that neighboring farmers, by associating together, it would seem, could adopt a system so as to manufacture staples of their own immediate raising, without any great risk or outlay of capital, and thus secure to themselves the profit of manufacture which in most instances exceeds that of growing the raw material. To accomplish this successfully, specialties in farming must be sought for, and the system of mixed husbandry in part abandoned. We have reason to believe that our farming often, and for the most part, is of too mixed a character to be the source of the highest profit, or for obtaining the best results; since he who makes a business of growing for the market wheat, flax and wool; who is engaged in stock raising; who dabbles in the dairy, at the nursery business and in gardening, is not apt to succeed in all, or become pre-eminent in either. All experience teaches that by confining the attention to one or two branches, and making them specialties, great and rapid advances are made, and strong landmarks erected in the direction of permanent improvement.

American cheese-dairying may be said to have taken its rise in Herkimer county. It was here that the business first became developed as a specialty, resulting in large yields of cheese from a given quantity of milk—

better quality of cheese, and improved apparatus for its manufacture. The European trade in dairy produce was commenced and built up by Herkimer county men, and is still mainly under their control; but the inauguration of cheese manufactories is properly due to the adjoining county of Oneida. This system of cheese manufacture has not been sufficiently tested to render it certain that it is to displace entirely the old methods. Some of its features are objectionable, which, if not in some manner overcome, may deter many from giving it a trial;—they will be noted hereafter;—while we now proceed to touch briefly of its history.

Some ten years ago, Jesse Williams, in the vicinity of Rome, Oneida county, conceived the idea of manufacturing into cheese, together, the milk from several neighboring dairies—gradually increasing his business, until he had under his immediate supervision the milk of some six hundred cows. The system grew in favor with dairymen of that locality, inducing other manufactories of a similar character to spring up within a circuit of a few miles from the parent factory; all of which giving general satisfaction in their immediate neighborhoods, began to attract the attention of dairymen and of cheese dealers. The novelty and apparent convenience of the plan were not the only recommendations to favor. Choice cheese, uniformity in size, quality and flavor, being produced in such large quantities together, commanded a higher price in market than that paid for the majority of single dairies. From these beginnings, and the success thus far attending the several establishments, the plan has come to be regarded as feasible by many, and rendering it not improbable that in a few years its adoption will be wide-spread.

The following are some of the factories in operation the present season (1863) in the county of Oneida, as furnished me by Mr. Chassell of that county:

Deerfield (Lewis & Horn, superintendents)	700 cows.
Marcy (Wilcox)	600 "
do (Tanner, Wood & Ashly)	1,000 "
Kirkland (Blackstone)	500 "
Hampton (Williams, Adams & Derry)	300 "
Lowell (H. S. Rose)	500 "
Rome (Jesse Williams)	600 "
do (Greenfield)	400 "
do (Allen & Russagee)	500 "
do (Cady & Chandler)	300 "
do (Crosby & Huntington)	400 "
Verona (Weeks)	400 "
do (Durham)	300 "
Delta (F. Smith)	600 "
Lee (W. D. Sexton)	500 "
do (Geo. Wood)	300 "
Lee Centre (P. Charton)	400 "
Florence (Saveny & Coventry)	500 "
West Branch (Williams)	300 "
Westernville (Hill)	300 "
Verona village (Hill)	300 "
Verona Center (Lamphen)	200 "
New Hartford (Sherman)	300 "
Trenton (H. J. Fowler)	300 "
Remsen (W. Mitchell)	400 "
do (D. Thomas)	400 "
Holland Patent (T. Pierce)	600 "
Steuben (W. Brooks)	400 "
Floyd (J. Davis)	350 "
Vernon (Clark)	350 "

Trenton (W. W. Wheeler)	800 cows.
Stittville, (J. W. Rathbone)	700 "
South Trenton (Whitaker & Curry)	600 "
Whitestown (Williams & Smith)	600 "

In the volumes of State Transactions for the years 1860 and 1861, I gave brief treatises on the dairy, showing the manner in which cheese dairying was generally conducted throughout the best dairy districts of New York. In the present paper it is not proposed to reproduce points discussed in those articles, but rather to examine the relative merits of the factory system of manufacture, as compared with that in common practice, and giving in brief the manner in which these establishments are conducted.

Cost of Manufacturing Cheese in Families, etc.

In order to compare the two systems understandingly, it will be well to make an estimate of the actual cost of manufacturing cheese after the ordinary methods, say from a dairy of forty cows, together with the care and marketing of the same. We estimate from the point when the milk is in the vats:

Original cost of cheese house, including tables, &c	$410 00
Vats and heater	50 00
Press, hoops, curd knife and other utensils	40 00
	$500 00
Annual interest on original outlay	$35 00
Dairy maid, say half time for nine months, including board	60 00
Man's time about the dairy, turning cheese, &c., &c., say average of one hour each day for nine months,—twenty-five days, at $1	25 00
Annual cost of fuel, and its preparation for vats and curing room	15 00
Man's time, boxing and marketing cheese, including team, say two days per month,—eighteen days at $1.50	27 00
Annual wear and tear of dairy utensils, and keeping buildings, &c., in repair	15 00
	$177 00

Forty cows, averaging 500 lbs. cheese per cow, gross amount	20,000 pounds.
Cost per pound for manufacturing, nearly	9 mills.
Thirty cows, 15,000 pounds, say	11 "
Twenty cows, 10,000 pounds	17 "

It will be seen then that the cost of barely manufacturing cheese in single dairies will average a little more than one cent per pound, and this sum, for the most part, is the actual cost in cash paid out, for we have not taken into account the general supervision and care necessary in the manufacture and curing of cheese, which cannot be entrusted to domestics, but must daily occupy the time and attention of the proprietor or some portion of his family, who have something beyond mere wages to stimulate to action. And here it may be proper to observe that one of the inconveniences which is widely felt among dairymen, results in the difficulty of obtaining careful and reliable hands for the management of the dairy. If it is desired to make a first class article, cheese that will command in market the higest price, all the operations of manufacture must be performed by tried and skillful hands—hands that can rarely be obtained for hire, and when obtained, commanding comparatively large wages.

Now as cheese making is an art which must be learned like other trades, and as most of its operations are performed by females, the dairy farmer

may be said to have, for the most part, nothing but apprentices in his employ, since, when his dairy maid has been carefully taught the trade, she marries, and is at once lost to the laboring community.

This scarcity of skilled cheese makers is severely felt throughout the whole dairy region, necessitating the farmer and his family, and more especially the female portion, to arduous labor, taxing their strength to a degree that tells heavily on health and constitution. The result is that persons prematurely aged and with broken health, are more frequently found in a dairy region than in other farming communities.

The introduction, within a few years past, of improved dairy apparatus, has, it is true, lessened the labor of cheese making, but the business still demands the same skill and careful oversight; the want of one or the relaxation of the other resulting not only in immediate loss, but exerting a damaging influence on the reputation of the dairy.

There is no desire to say one discouraging word of a business which has added so much wealth to the country, and in which those who are engaged generally prosper and soon become independent in worldly goods; but the truth, nevertheless, must be told. Wealth has its advantages, but its price should be kept in view; and if overtasked muscle, incessant care, without relaxation, and finally disease is to be the patrimony of wives and daughters, its charms, to say the least, are very much diminished.

A point of some moment to those engaged in cheese making, is high skill and perfection in manufacture. It is not deemed necessary to enumerate all the reasons why this does not generally obtain. The fact is patent that the choice cheese is made by a comparatively small number, rather than the majority of dairymen. Even among those noted for producing a strictly prime article, the process of manufacture, as well as other work of the dairy, is at times hurried and neglected, and must be necessarily so from the nature of things. It does not pay to keep an extra force on hand to take the place of those who may be disabled by accident or sickness, or who, from other causes, are obliged to suspend work.

Occasional periods of farm labor, too, demanding immediate and pressing attention, occur more or less frequently, the result of which is imperfect cheese; this must be marketed as such and at corresponding prices. One or all of these causes have been in operation in every dairy, and must continue to occur from time to time. What the losses from this source may be through the year, depends, of course, on the many and various circumstances that have controlling influence in each particular case. We have known it to be large enough in many instances to cover the whole cost of manufacturing the entire cheese of the dairy for the year.

Dairymen are conversant with these facts, and they are points to be considered, and should have their proper bearing in making up our estimate of the two systems.

Advantages of the Factory System.

The advantages claimed for the factory system are superior quality, uniformity, higher prices, saving by buying at wholesale such materials as salt, bandage, annatto, boxes, etc., and finally, relieving the farmer and his family from the drudgery of the manufacture and care of cheese.

It is not pretended that a better quality of cheese can be made at the

factory than in families, but that it is quite as fine as the best, and therefore above the average of that manufactured in small parcels. We have enumerated some of the causes which conspire to depreciate the quality of cheese when made in single dairies; these are not present in the factory system.

The agent, or superintendent, makes it his business to see that all parts of the work are properly performed. He employs skillful workmen; his interest and reputation are at stake, prompting him at all times to do his best. He knows that neglect or mistakes will not be tolerated, and the desire to satisfy persons interested, in order to secure their patronage, stimulates him to make every exertion to build up and sustain a reputation for "fine goods." He has every convenience at hand for manufacturing to advantage, and making the business a specialty and a sole employment. He is not liable to be disturbed with other matters which might serve to call his attention away from time to time, to the prejudice of the immediate work at hand.

The same rule must hold good with him as among those engaged in other professions and arts, for he who gives his whole attention and energies in a certain direction is likely to become more skilled, and arrive nearer to perfection in his calling, than he who is striving to do many and diverse things well at the same time; more especially in cheese manufacture under this system, as a high degree of skill is expected, and jealous and interested eyes are daily watching and noting every mistake and shortcoming. Uniformity and fine quality are therefore more likely to obtain under this system, and whatever progress can be made toward improvement, will naturally develop itself more rapidly here than among persons scattered over a broad extent of country, and who are so occupied with a variety of work as to have little time to spend in the improvement of any one particular branch.

The factories, so far as we are acquainted, have acquired a high reputation for fine quality and uniformity. At some of these establishments we have seen a large number of cheeses, making in the aggregate more than one hundred thousand pounds, so uniform in appearance, as they lay on the tables, that the most practiced eye could detect scarcely any difference in their manufacture. Such a quantity of cheese, uniform in size and quality, will usually command a higher price in market over that of single dairies, from the fact that in the latter an allowance is always made by the purchasers for unequal or imperfect cheese. Factory cheese generally sells at a price above that of single dairies equal to the whole cost of manufacturing. In November, 1862, long dairies, made in families, of good quality, were selling at from ten cents to twelve and a half cents per pound, while factory cheese, of Oneida, sold at fourteen cents per pound, and the large size, those weighing from 700 to 1,000 pounds each, brought in some instances as high as seventeen cents per pound.

We have alluded to some of the causes that operate to increase the price of well made factory cheese over that of private dairies. Another may be added, in the less time, trouble and expense of purchasing. The whole quantity made from six hundred or a thousand cows can be bargained for and bought at no more time and expense than a "twenty cow" dairy.

This item amounts to a considerable sum in the aggregate, as experts are employed by the principal commission houses in cities, by shippers and dealers, to select and purchase cheese, under salaries ranging from $500 to $1,000 per year. Others, again, get a certain percentage on what they buy. These sums, of course, come out of the producer, and hence by so much must depreciate the price of cheese. Another saving is also made in buying the materials used, such as bandage, salt, annatto, boxes, etc., at wholesale instead of retail.

We come now to consider the most important advantage to farmers in this union arrangement. It is the relief from the drudgery of cheese making, and the constant care and attention necessary in properly curing and fitting the cheese for market. It would be difficult to estimate this in dollars and cents, since health enters into the account more largely than is generally suspected.

It is believed, and we speak advisedly, that the old method of cheese making has done more to injure the health of women in cheese dairying districts than any other cause. Much of the work about the dairy ought to be performed by men, but too often the manufacturing and most of the care of cheese are left wholly to females, overtasking their strength by hard and exhaustive labor, thereby laying the foundation of weakness and disease.

As the same process is to be gone through with in manufacturing cheese, whether the quantity of milk be large or small, and as nearly the same time also is occupied, it will be seen that what requires the labor of a great many persons to do when cheese making is divided up in families, can be accomplished with but a few persons on the factory system, some five or six being sufficient to do the work about an establishment manufacturing the milk of a thousand or more cows.

Objections to the Factory System.

The objections urged against cheese factories are: difficulty of detecting adulterated milk, the carrying of milk to the factory and liability of sour milk, difference in quality of milk arising from the manner in which cows are fed and managed, the loss of the whey, necessity of manufacturing "the early and late made cheese" in families. These are the principal objections urged by dairymen. As the milk is measured at the factory, and each credited with the amount daily furnished, it is evident that when there is a considerable quantity a dishonest person could add water, and thus increase the number of gallons. Such cases have occurred, and the individuals cheating have been summarily expelled from the association. We know of no instrument or mechanical device that will detect watered milk, and therefore a watchfulness on the part of the superintendent, and the exclusion from the association of persons of doubtful honesty, are the only means of meeting the difficulty.

Some object to the labor and trouble of carrying milk to the factory, and the necessity of keeping to regular hours for its delivery under all circumstances of weather, inconvenience, and disability from other causes, since no delay at the factory can be made for the milk of a single dairy without hazarding the acidity of a large quantity, at least that contained in one

vat, besides deranging in some degree the regular factory work. Others contend that once having the milk, the cheese can be made by the family with but little more trouble and labor than that of carting milk, while one's own time and convenience can be studied at pleasure, and the cheese at all times under immediate control.

Without extra care and cleanliness as to the pails and milk cans, there is liability of sour milk from time to time, which of course would not be received at the factory, as milk only slightly acid would damage that with which it came in contact. The milk cans for carrying the milk, it may be observed, are somewhat difficult to cleanse and to keep sweet, and the confinement of the milk, and its agitation while being carried, in hot weather, renders it susceptible to change, especially if there be the least taint of acidity about the cans.

Dissatisfaction often occurs at the factory with regard to the condition of milk—the superintendent being certain that the milk is slightly, and perhaps perceptibly changed, while the farmer stoutly insists that it is perfectly sweet, and he goes home in no pleasant mood complaining that his cans were not properly cleansed, laying the fault of the sour milk perhaps on some member of his family, or disbelieving that the milk was changed. If the milk is not received at the factory, it is a loss to the farmer. If it is received in an acid state, it is a loss to all the stockholders. Hence it will be seen more or less trouble is brought about on this account. Not unfrequently bad feeling is engendered on the part of the farmer and his family, and he withdraws from the association. Another objection is urged, and with some apparent reason, that the quality of milk varies with different persons according to the manner in which the cows are supplied with food and are managed through the season. It is contended that clean, sweet, upland pastures, where the herds have an abundance of food, with a plentiful supply of pure water, when they have been wintered well, and are receiving careful treatment in every respect, will produce a better quality of milk, from which more and better cheese can be made than when the reverse is practiced. And yet the poor herd that has been wintered improperly, that is pastured on the coarse herbage of low lands, with general bad treatment on the part of the owner, is credited according to the quantity furnished on an equality with the better herd. It is not easy to see how this can be remedied, without excluding such from the association.

Then there is the loss of whey, which is regarded by some to be an important item in the way of pork making, or as a feed for cows, for the whey is the property of the person who runs the factory; but even were it given to the farmer, there is yet the trouble and expense of carting it home. An objection is also urged against the system, that in fall and spring, when cows are "coming in" or being dried off, the quantity of milk is too small to be carried with profit to the factory; that the family butter is to be made; that it pays better to take off the cream for butter and turn the skimmed milk into cheese, and that therefore, as the factory does not wholly do away with cheese making in families, cheese apparatus and implements are necessary, and if the spring and fall cheese is to be made at home, the other portion of the dairy may as well be made there also. This objection

could be partly met by setting the milk and taking off a part of the cream, and delivering the milk every other day, or at longer intervals.

We have now presented both sides of the question, and are prepared to advance another step in the discussion which brings us to

The Organization—Selection of Factory Site, etc.

Cheese factory associations are organized in neighborhoods of ten or a dozen or more farmers.

When it is proposed to start a factory, several persons who are neighbors to each other get together and talk over the matter among themselves. If enough are found willing to turn in their dairies together, so as to make a fair start, (say 300 cows,) a committee is appointed to look further into the matter, to visit factories, and get all the information on the subject that can be had. A favorable report from the committee being had, they then organize, choose directors, and adopt some general rules or plan for the guidance of the association. The next step will be the selection of some experienced cheese maker as superintendent, and the place for the erection of the factory building.

Generally some person proposes to put up the buildings on his own account, and to manufacture and take care of the cheese at a fixed price per pound, demanding a contract on the part of the farmers to furnish the milk of the requisite number of cows for a certain number of years.

The milk of about 400 cows, it is believed, is the smallest quantity that can be employed by the manufacturer, (when cheese making is his sole business,) in order to obtain a fair living compensation for services, while the milk of a thousand cows can be manufactured at but little extra expense comparatively.

FACTORY SITE.

In choosing the place for the erection of the factory buildings, two requisites are sought—good water and convenience as to access and distance for the dairies furnishing the milk. The site, above all, should command an abundance of pure spring water. This is regarded by those who have had longest experience at the business as imperative.

Even in family cheese making a considerable quantity of water is needed in various ways about the dairy, for cooling milk, cooking the curd and keeping the utensils and buildings clean and sweet; but for the factory the quantity of water should be abundant and unfailing. It is usual to have a considerable stream of water passing under the manufacturing room, so as to carry off the drippings of whey and refuse slop, so that there be no accumulation of filth or taint of acidity hanging about the premises. Where whey and slop are allowed to collect from day to day about the milk room, the stench at times becomes intolerable, and must do great damage to the milk, which absorbs taints of every character with great readiness. Hence means must be taken to have all the refuse matter swept beyond the reach of the premises.

Some factories are being built where dependence for water is placed upon wells of large capacity, but these are as yet experiments to be tried. At all events, it will be seen that much more labor will be required, with greater liability to taints, than where spring water, passing in a considerable stream under the building, can be had.

Where it is admissible, the manufacturing room should be located with a bank on one side, several feet in height, and forming a road on which the teams drive and deliver the milk through the receiving windows, thus giving the proper descent to the weighing or measuring apparatus, and from thence to the vats. Where the bank is wanting, a platform must be raised for the purpose indicated.

If it is proposed to employ some one person to collect and deliver all the milk, then the factory should be located at a point where the work can be effected at the least trouble and expense.

The Buildings.

The buildings to be erected will consist of a manufactory or place for making the curd, a press room, dry house or curing rooms and an ice house.

The dry house should be a separate building, so as not to be affected by dampness, and in case of fire, that the cheese may be more readily removed. At one of the establishments near Rome, Oneida county, recently erected, and where the milk of 600 cows is used, the size of the buildings is as follows: Manufactory, 26 by 26 feet; story and a half; press room, 39 by 13 feet; dry house, 26 by 100 feet; two stories high. Cost of the buildings, with fixtures, about $2,500.

These buildings consisted in nothing but frames shingled and covered with rough siding, and even not lathed and plastered.

The curing house, where it is not proposed to lath and plaster, should be sided with matched floor plank, and provided with ventilators at the sides and top on the plan of the "dairy house," described in my treatise published in last year's State Transactions.

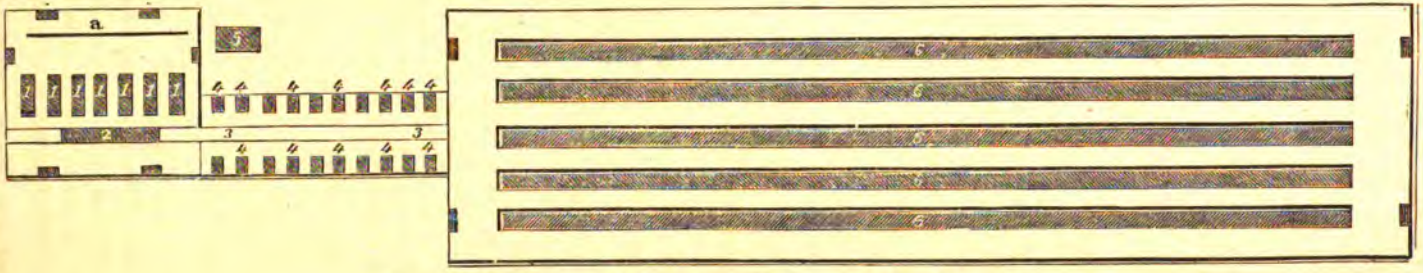
One of the best arranged plans for buildings and fixtures that I have seen is that of the new factory of Frazie's, at Truxton, Cortland county, N. Y., which goes into operation the present year (1863). Mr. Frazie formerly conducted a factory near Rome, N. Y., and had there made considerable improvement over the original or early built factories. The new buildings are a great improvement over the Rome establishment.

I am indebted to Mr. Smith, who has charge of the manufacturing department of the Truxton factory, for the draft of ground plan of these buildings, the cut of which is here represented.

This factory has capacity for manufacturing the milk of 1,500 cows, and was expected to start with that of 1,200.

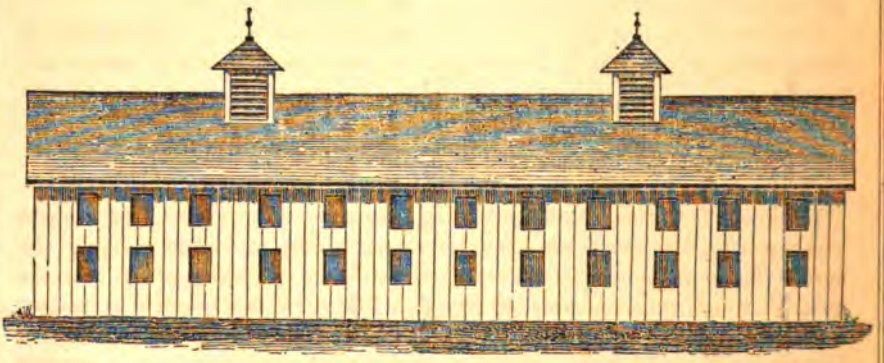
Mr. Smith, in a note says: "The manufacturing room is 32 by 40 feet, and contains seven vats, 15 feet long by 3½ feet wide, of six hundred gallons capacity each. There will be two places by which the milk can be emptied, so as to keep the wagons waiting the least possible time. The milk will be *weighed* instead of being measured. Adjoining the work room is the press room, 50 by 16 feet; there are 10 presses on each side. The sink containing the curd stands on rails, so as to be run into the press room opposite the presses. There is a space of four feet behind the sink, so the hands can work the curd and not interfere with those who are dipping it out.

"The engine, of eight horse power, stands in a separate building. There is a (horizontal) main steam pipe, six feet from the floor, to which are



Ground Plan of Frazie's New Cheese Factory, at Truxton, N. Y.

Front View of Manufacturing Room of Herkimer Cheese Factory, Herkimer, N. Y.



Front View Cheese Curing House, Herkimer Factory, Herkimer, N. Y.

attached six steam pipes connecting with the vats; the hands can in this manner go around either end of the vats.

"The buildings are on a level, so the cheese can be run from the press room on trucks into the curing house, between the counters; no carrying the cheese, as at the original Frazie factory.

"The back side of work room is built of masonry, and the water, fifty feet fall, brought into a large reservoir directly under the platform upon which stand the receiving cans. Under the work room is laid flagging, over which flows a stream of water to keep it free from any matter that might collect there if the soil under the building was soft.

"The whey vats will be a long distance from the buildings, for we believe the milk will absorb any impurities of the atmosphere. Hog pens will be dispensed with entirely, for past experience proves to us that if cheese is properly made there is not enough nourishment left in the whey to make it profitable for pork raising."

The accompanying cut shows the ground plan and buildings of the factory near Herkimer, Herkimer county, under the supervision of Mr. H. Farington, who for many years has been widely known throughout the dairy region as an extensive cheese dealer. The cut shows the bank alluded to, where the teams deliver the milk. The floor of the manufacturing room should incline a little towards the center, so that, in cleaning, the slops may be discharged into the creek.

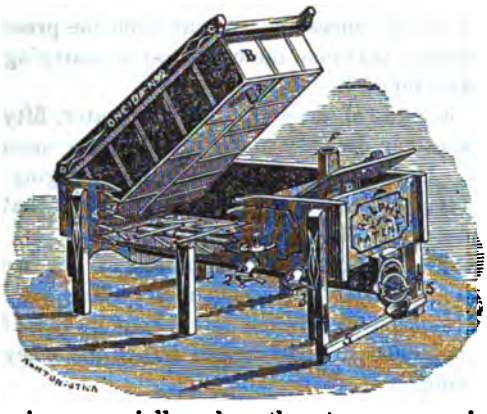
The Herkimer factory has facilities for manufacturing annually 300,000 pounds of cheese. The manufacturing room is 28 by 48 feet, and the curing house 28 by 100 feet and two stories high. There are four tin cheese vats, placed inside an equal number of wooden vats, the milk in which is to be heated by steam; each vat holds 400 gallons.

The ice house has capacity for holding 100 tons of ice. The cheese at this factory is pressed in a twenty-three inch hoop, and will weigh 150 pounds each. This factory is built on the improved plan, and all the internal arrangement quite convenient.

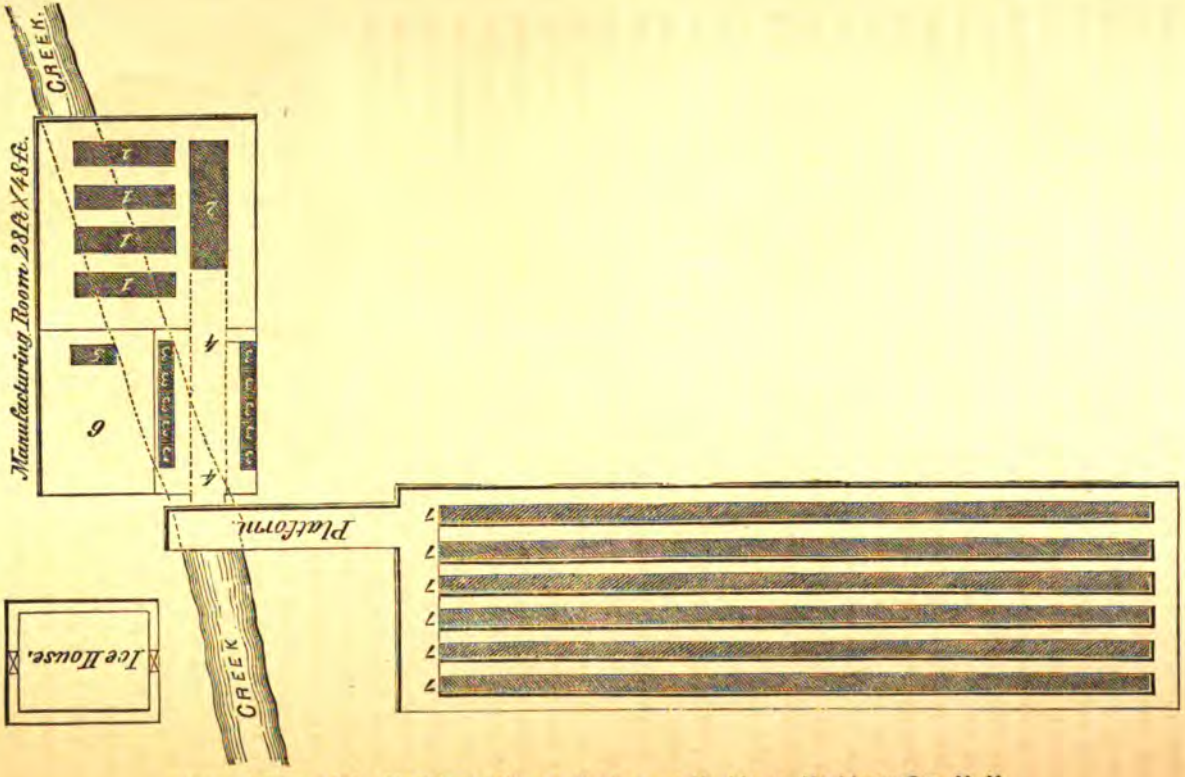
Apparatus.

In cheese factories, steam boilers, or a steam engine of from four to eight horse power, are commonly used for warming the milk and cooking the curd. The milk is held in double vats, the inner one being of tin, and the outer of wood, and so connected together that there is a space of some two inches or more between the two, on the sides and bottom. This space is for the reception of water, and is provided with conducting pipes, so that when the steam from the engine is applied, heat may be distributed as evenly as possible. The different styles of vats with heaters attached, which are employed in family cheese-making, are not in general use at the factories. Many of these apparatuses take a considerable quantity of fuel to be operated, and, when several vats are needed, are supposed to be more expensive to keep running, and less convenient, than an engine or boiler. The factory vats hold from 400 to 600 gallons each, and are heated as each is filled with milk; thus making a succession in the work, rendering all the subsequent operations to be more easily accomplished than where the milk in all the vats is heated and set at the same time. The

milk in being delivered by the farmers will occupy two or more hours, and hence this arrangement of time in heating serves as a convenience to all parties. Where wood is of much account, the running of an engine must be attended with considerable expense; and it is a question, therefore, whether large vats and heaters may not be substituted with economy. It is not easy to see why they are not to be preferred in point of convenience. The engine makes a loud and disagreeable noise, especially when the steam comes in contact with the water about the vats. It requires close attention and some skill in its management; is expensive, and more or less liable to explosions. It is believed the vats and heater of Ralph's patent (a representation of which is given in the cut) would be more economical and in every way preferable. We have never seen them in use at the factory, but understand they are now being introduced. This apparatus takes the least fuel of all the apparatuses in use for family cheese-making, while it is the simplest, and, to our mind, the most convenient and efficient. With regard to uniformity or evenness of the milk's temperature in heating, which is important in cheese-making, the following result of an experiment with a large Oneida vat and heater is given by Mr. Ralph, and will be of interest, perhaps, in this connection. He says:



"I yesterday made another trial with a large vat; size of tin vat, 15 ft. 3 in. long, 3 ft. 2 in. wide, 19 inches deep. The vat had no tank attached; had an 11-inch heating cylinder extending the whole length. The tin vat had within it a little over 500 gallons of water, at 36 deg.; the water in the space between the vats was of the same temperature, and was 1 foot ½ in. deep; weather lowery; no wind; temperature of the room, 40 deg. The quantity of wood consumed in the experiment was, of beech and maple, 11 pounds; of pine, spruce and hemlock, 64½ pounds, producing an uniform heat of water contained in the tin vat of 105 deg. The thermometer, of Fahrenheit scale, was suspended on a plank, so that the bulb was immersed the same at all the different trials and places within the vat. The temperature of the water in the tin vat was taken each fifteen minutes after the fire was made, and the temperature noted. Mr. Henry Tew, of New Berlin, Chenango county, was present; also my foreman, Mr. Jesse Parker, and witnessed the trial—Mr. Tew assisting, and noting all that transpired. He expressed himself surprised and much pleased with the result. All being ready, the fire was started at two o'clock P. M. precisely, and was not crowded, though a good fire was kept up. The temperature at the times taken was as follows:



Ground Plan of the Herkimer Cheese Factory, at Herkimer, Herkimer Co., N. Y.

Time.	Front end.	Middle.	Back end.
2.15	47 deg.	44 deg.	40 deg.
2.30	56 "	57 "	56 "
2.45	67 "	66 "	65 "
3.00	74 "	74 "	78 "
3.15	82 "	83 "	82 "
3.30	93 "	93 "	93 "
3.45	99 "	99 "	98 "
4.00	104 "	103 "	103 "

"At this point, the fire having got somewhat low, the damper was applied, and at four o'clock and fifteen minutes the thermometer was again tried, and stood at 105 degrees throughout the vat, thus showing that by an equalization of the heat between the water in the space between the vats and that in the tin vat, the heat rose but one degree. The thermometer was finally tried at four o'clock and thirty minutes, and stood at all parts of the tin vat 105 degrees, showing no additional heat. Mr. Tew claims to have had experience in the use of steam boilers, and gave it as his opinion that the wood used would have been but little more than sufficient to have got up steam in any boiler adapted to the business." It will be observed that the temperature of the water at starting was far below that at which milk is usually started.

We learn that at some of the new factories, where these vats and heaters have been introduced, and where they were operated by persons who had formerly been employed in factories using the steam boiler, that the vats and heaters are much preferred, as saving time, fuel and labor, while they are regarded in every way as more convenient and pleasant to operate; producing a more uniform curd, with less stirring, and giving the manufacturer greater control over temperature within the time required for the proper performance of his work. Those about erecting factories would do well to make a careful examination of the merits of both plans for heating, and for this purpose a visit should be made to factories where each can be seen in operation.

At the older factories the syphon is used for drawing the whey, but with properly constructed vats, it would seem, is unnecessary.

The Presses.

The presses at these establishments are of the simplest character, and consist in nothing but a stout iron screw, with the proper wood work attached for holding it in position, and a platform on which the hoop holding the curd rests when put in press.

Several of these presses are frequently connected together by framing the uprights of each press to stout beams, or square pieces of timber running nearly the whole length of the press room. The screws when turned up pass through the upper beam and are turned down on the cheese with an iron lever, from time to time, until the desired pressure is acquired, and the work of pressing accomplished.

When the cheese is turned in press it is bandaged with a kind of thin dressed cotton cloth, similar to bleached goods, but manufactured specially for the purpose. This style of bandage, when carefully pressed on, gives to the cheese a remarkably smooth and neat appearance. Thick, heavy bandage, it may be proper to observe, should not be used on any ordinary sized cheese, as it is more liable to produce mould. The bandage having

been properly put in place and the hoop slipped on, circular caps of cotton cloth, the size of the cheese, are added at top and bottom, so as to give a perfectly smooth surface to the new cheese when it comes from the press, and care is taken that it be pressed true, and that the rind be closed in all its parts, for a badly pressed cheese can never afterwards be made to assume a handsome appearance.

It is claimed that the screw can be managed more readily in pressing the cheese to a perfect shape, that it is less expensive, and occupies less room than other devices for the purpose, and hence is best adapted to factory use.

When some person is at hand to watch and attend to the pressing, the inconvenience in using this character of press is perhaps not so much felt, but in family cheese making, where help is limited, they would be considered a nuisance, for the farmer requires a press that will follow up its work, and do the pressing faithfully without watching.

At some of the factories the screw is beginning to be regarded as objectionable on this account, since they can receive no attention during the night. Hence strong presses, like "Oyston's Herkimer county," and other devices of the kind, are being in some places substituted. The main advantages of the screw are its trifling cost, its strength, and the small space which it occupies; in other respects it is believed to be inferior to other devices for compressing the curd.

The Hoops.

The hoop in which the cheese is pressed is of pine staves, bound with heavy band iron, and very carefully made, the inside being turned or worked down true and smooth.

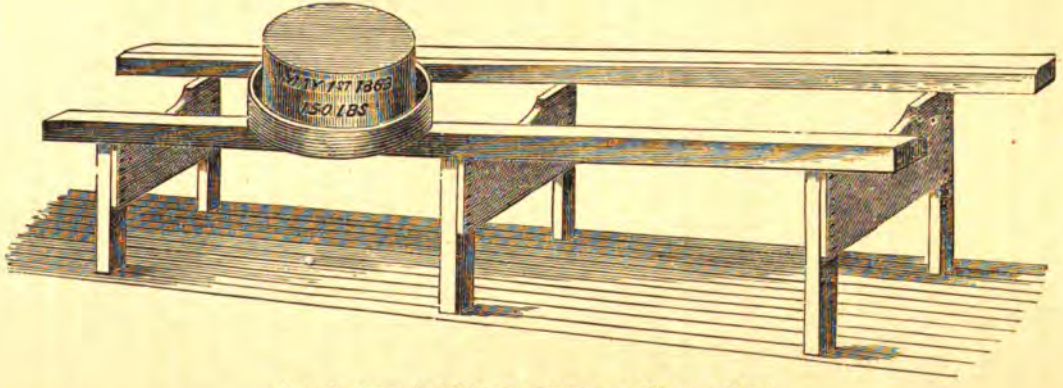
A good proportioned cheese is in height about half the size of its diameter, and the hoop therefore should be high enough to conveniently hold the curd and accomplish this end. When a hoop of twenty-three inches in diameter is used for cheese weighing 150 pounds, it should be at least fourteen or fifteen inches high, and be provided with iron handles on the sides for convenience in moving and slipping it from the cheese.

Messrs. Ralph & Co., of Utica, New York, have devised and are manufacturing metal hoops which are very convenient, and admit of a closer fitting follower than wood, which shrinks and swells. Some of them are of tin, heavily but neatly banded, while the latest pattern are of galvanized iron. We have used both styles in our own dairy, and are much pleased with their operation.

The Milk Cans.

A suggestion in regard to properly constructed milk cans for delivering milk, may perhaps be deserving of a passing notice.

Cans holding from forty to sixty gallons will be of convenient size, and should be well and nicely made from the best of tin. The cover should be with a rim, and tapering, so that it may be pressed into the can, and down to the milk, making a close fit. In the center of the cover is a three-quarter inch hole for the air to escape while pressing the cover to its place; it is then to be closed with a cork. A faucet is provided near the bottom for conducting out the milk into the receiving cans at the factory, where it is



Newly Invented Cheese Range or Cheese Rack.

measured or weighed by the superintendent. Formerly the milk was measured, but latterly weighing seems to be in favor.

The platform where the receiving cans are placed stands higher than the vats, and as fast as each dairyman delivers milk it is weighed and conducted into the vats by merely opening the faucets. This platform commands a view of all parts of the manufacturing room, is provided with desks, and it is here the books are kept for noting the quantity of milk delivered, and the calculations made for the quantity of rennet, annatto and salt to be used for each vat of milk.

The Table and Cheese Rack.

Tables of convenient height for handling the cheese are arranged in the curing house, on which the cheese is placed as it comes from the press, and where it remains during the process of curing. Each cheese when it is placed on the table receives a record of its weight and date neatly marked on its bandage.

The wood best adapted for the table bed is hemlock. It should be smooth and level, and made of well seasoned stuff. Pine is sometimes used, but being more or less resinous is apt to impart something of its flavor to the cheese; the cheese also adheres to it more closely than hemlock. Wood like basswood is objectionable, doing damage to the cheese, and should not be used, for it adheres so closely to the cheese as not to be readily loosened, marring the rind and oftentimes taking out considerable portions of the cheese. It may be proper to say that the table bed, where the cheese rests, should never be painted. The recent invention of the cheese rack is a great improvement over the table.

The cheese rack consists of scantling, four inches by five inches, with the corners beveled or cut so as to be 5-sided; these are framed the proper distance apart at the ends, and set on legs of the desired height, forming a skeleton table. Round covers, of inch hemlock or pine, bound with stout elm rims, three or four inches wide, set upon the racks and hold the cheese. When the cheese is to be turned, a spare cover is placed on top, and the cheese and covers turned over; the cover now on top is removed, rubbed with a cloth, and is ready to be applied to the next cheese. The rims of the covers protect the edges of the cheese in the process of turning; and a part of the cheese, swinging down in the open space between the timbers and the rims, resting on the beveled sides, renders the operation not only easy, but it insures safety to the cheese. A large cheese can be turned with as much ease on a properly constructed rack as the loosening of a smaller cheese on the table preparatory to being turned. Large cheese are difficult to handle on a table, and are liable to have their edges broken, or in other ways marred in turning. The subjoined cut will give a better idea of the manner of constructing the rack.

The Sink.

The sink, where the curd is drained and salted, should be convenient to the vats, movable, being provided with rollers and placed on a track leading to the press room, so that the curd may be dipped directly into the hoops where it is to be pressed.

This will not only be a saving in time and labor, but will avoid occasional losses in dropping particles of curd or spilling it by accident, which is liable to occur when it is carried by hand from one room to another. It will be scarcely necessary to observe that the whey vats should be a considerable distance from the manufacturing room; for as milk is very susceptible to taints, and is affected by the state of the atmosphere, every means must be taken to promote the most favorable condition in the milk for the production of fine cheese.

Size of Cheese.

In starting a manufactory some little anxiety will be had in regard to the most suitable size of the cheese to be made. This, doubtless, may be controlled somewhat, from time to time, by the market for which the cheese is manufactured. The home trade, during hot weather, prefers medium sized cheese, say from seventy to eighty pounds weight; but for shipping to Europe, there seems to be a growing demand for cheese of larger size.

During the season of 1862, cheese weighing from 140 to 150 pounds were in favor for the foreign trade; and this size is, perhaps, all things considered, most convenient for factory make. They are easily handled, and in case of accident either at the factory or in carrying to market, the loss is not so great as on the larger cheese.

Some of the factories have been making immense cheeses, weighing 700 or more pounds each, and the sales of such during the past season were in advance of the smaller size; but it is believed for extensive sales the market generally would regard them as objectionable. Ready sales of small lots of these large cheese could doubtless be made at an extra price, because, being rare, they would excite more or less curiosity, and induce purchases at the shops where they were to be cut and sold. But such cheese are of no better quality than the smaller size; they are more liable to be broken, are too large for families that are in the habit of purchasing a cheese from time to time, and therefore can never become popular for the general trade.

Cost of Manufacture.

The cost of manufacturing cheese is to the farmer one cent per pound; rennet, salt, bandage, annatto and boxes, as well as the carting of cheese to market, being charged to the association and paid by each dairyman in proportion to the quantity of milk furnished during the season. The whey, as has been before observed, belongs to the factory.

All other expenses, including the care of the cheese while curing, &c., is paid by the manufacturer.

To run a factory using the milk of 600 cows will give constant employment to at least four persons, half or more of whom may be females.

At one of the factories near Rome, N. Y., in 1862, the price paid for the services of a man and woman, who were the foremen of the establishment, was one dollar each per day and board; others received from two dollars to four dollars per week; and I was informed that the actual cost of manufacturing the milk of 600 cows for the season, was $700. It is presumed

this sum did not cover interest on capital invested for buildings and fixtures, but was the amount paid out for labor, board, fuel, &c., &c.

From these data it will be easily estimated what amount of money can be realized from the business of manufacturing. Allowing that the 600 cows produce on an average 400 pounds cheese each, there will be in the aggregate 240,000 pounds. The cost of a well-constructed factory will not be far from $3,000.

We have, then, 240,000 pounds at one cent		$2,400
Cost of running factory	$700	
Interest on buildings, &c.	210	
Annual wear and tear, or depreciation of property	200	
		1,110
Profits		$1,290

Now, for 300 cows, nearly the same expense would be incurred, and the factory account would stand thus:

120,000 pounds cheese at one cent		$1,200
Expense of running factory	$700	
Interest on capital invested	210	
Annual depreciation of buildings, fixtures, &c.	200	
		1,110
Profits		$90

We do not pretend to give the exact figures in the above estimates, but it will be seen that a factory manufacturing the milk of a less number than 300 cows will not be a very paying business, unless the manufacturer can have most of the work performed by members of his own family.

Delivering the Milk.

When a factory is located in a neighborhood where all or nearly all the dairymen are on one street, some one of the number may be employed to gather up the milk of the several dairies, and deliver it at the factory. Neighbors living near each other may take turns, each delivering one day out of the week. When men are hired to gather up and deliver the milk for a neighborhood during the season, the price paid for such delivery is one dollar per cow.

Treatment of the Evening's Milk.

In cheese manufacture an important point to be considered is the proper management of the evening's milk; and in order to do this to the best advantage, the state of the atmosphere must be observed at the time the milk is placed in the vats. The milk-room should be cool, airy, and free from impurities. In hot and sultry weather much care and attention must be given to the evening's milk, to have it well exposed to the atmosphere and thoroughly cooled down before it is left at rest for the night. When there are large quantities of milk to be attended to in hot weather, it will be better to spread it thinly over a considerable surface, rather than deeply, as in filling the vats. The temperature of the evening's milk should be so reduced that it will stand in the morning at about 62 deg. or 63 deg., and it should be reduced to at least 62 deg. before leaving it for the night. At the factories, where the carrying of the milk and the mingling it

together from several dairies has doubtless a tendency to hasten its acidity, there is more necessity for care and attention than in families; or rather there is more danger of too much acidity.

It may be proper to observe, that the requisite degree of acidity in milk at the time of setting it with rennet, for cheese, is imperfectly understood by the generality of cheese makers, and must be learned by well and carefully-conducted experiments. It is not possible to make so good a quality of cheese from milk recently drawn from the cow, or from any milk that has been kept too sweet, as from milk that has acquired proximate acidity; that is, after the ordinary methods of cheese manufacture. Neither will it be possible to obtain the greatest quantity of curd from the milk so manufactured. Such milk will require a treatment of sour whey, which will be considered under its appropriate head further on.

At the factories, it is believed, there is more danger from too much acidity than otherwise, since there are many causes to hasten that condition of the milk which are not present in family dairies. In the factories it is usual to cool the evening's milk to about 60 deg., by letting in water between the vats, by the use of ice, and by lifting and stirring the milk. This, under all circumstances, is or should be attended to. The lifting and stirring of the milk and exposing it to the atmosphere not only serves to cool it down to the desired temperature, but in another way operates favorably on the condition of the milk for the production of fine cheese, since the stirring and lifting process allows the animal odor and impurities to pass off more readily. If a considerable quantity of milk directly from the cow be placed in the vat and cooled down without proper exposure to the atmosphere, it retains more or less of this taint, and more especially if the cream soon rises to the surface, forming a barrier of escape, and holding it in the milk. We urge, then, that the lifting, stirring and pouring of the milk, so as to come freely in contact with the atmosphere, is of material benefit.

Some idea may be had of the effect of this animal odor by placing milk recently drawn in a vessel where it is closely confined and excluded from the air. In a few hours it becomes fœtid and putrid. In family dairies too little attention is given to this point in the treatment of milk.

Process of Manufacture.

The general features of factory cheese manufacture are similar to the process employed by our best cheese makers in families, a description of which was given in my treatise on "*Cheese-dairying in Herkimer county,*" published in the volume of Transactions for 1860. Some slight differences are made, owing to the large quantity of milk massed together, and its proximate acidity when ready for manufacture.

At the factory the milk, at the time for setting or adding the rennet, is raised no higher than 82° or 83°. The vats of 500 and 600 gallons of milk will not lose heat so rapidly during the time necessary for thorough coagulation as when it is in smaller quantities. The milk, too, has doubtless reached a point of greater acidity than is usual in family cheese making, and therefore can and ought to be set at a lower temperature than when these conditions are not present.

At the time of adding the rennet, annatto is used for coloring the milk, a considerable quantity having been previously prepared and its strength determined, so that, in applying it, an uniformity of coloring may be maintained.

After the rennet has been added the vats should be covered with a cloth and left at rest until coagulation is perfected. The time occupied for this purpose will be from forty to sixty minutes. The curd is tested, from time to time, by raising a portion with the finger. If it readily splits apart, making a clean, smooth division, the whey forming rapidly, and presenting the peculiar appearance and feel which the experienced cheese maker detects without difficulty, it is ready to be cut. Six-bladed curd knives, sharp and two edged, are used for the purpose. Some manufacturers have a number of these blades set in a wooden or iron head, from a quarter to half an inch apart, with handles attached, so that the work may be quickly accomplished. The curd is cut lengthwise of the vat, and then across, forming perpendicular columns. It is then left at rest for a short time for the curd to settle and the whey to form, when the heat is applied and the curd divided into smaller particles. In this process the six-bladed knife is introduced, and the cut made parallel with the bottom of the vat, the curd being worked and the heat kept up until the mass indicates by the thermometer 88°. If the curd has been worked to the desired fineness, the vats are covered and left at rest for the cooking process to be slowly accomplished. After standing, say three-quarters of an hour, heat is again applied, and the curd stirred and worked until the mass indicates about 98°, which is the highest heat to which it is subjected.

One peculiarity in the factory manner of treating the curd, and which is also practiced by the best cheese makers, is that the curd is very carefully handled, and the work not hurried. The curd is left to steep in the whey for a considerable length of time, which is supposed to give the cheese a sweet, nutty flavor peculiar to a well made and "strictly prime article."

The curd must be sufficiently cooked, and in such condition as to cure down firm and solid in texture, presenting in the trier a solid, uniform bar, free from honeycomb appearance. To do this, and have it mellow and buttery, and perfect in every respect, will require considerable observation and experience in the manufacture of cheese. When the whey is drawn, the mass will stand at about 96°.

The curd is then removed to the sink to facilitate a more thorough drainage and a thorough incorporation of the salt.

It is well to have the curd exposed to the atmosphere as long as convenient before putting to press, as the air has a favorable influence on the curd in producing fine cheese. We have heretofore suggested the advantages resulting from the exposure of the curd to the air as a means of securing a desirable color, and it may be observed that the majority of cheese makers pay too little attention to this matter, and also to the slow cooking of the curd, or the steeping it as long as may be in the whey; for an observance of these points secures the best results in quantity and quality.

After the curd is properly drained of whey, it is salted with pure fine salt, some factory manufacturers using two pounds and three-quarters and

others three pounds of salt for one hundred pounds of curd, or two pounds and five-eighths of salt to one hundred wine gallons of milk; but the quantity of salt is, of course, varied according to the time in which it is desired to have the cheese fit for market. If the cheese was to be marketed at thirty days old, a less quantity of salt should doubtless be used.

Salt, Rennet, etc.

The salt for dairy purposes should be a good article, *pure*, and ground fine, so as to be in condition to be distributed evenly through the curd. There is considerable risk in using the common salt sold in barrels. Some of it contains lime and other impurities, often in such quantities as to render its use unsafe in cheese manufacture, producing rapid decomposition of the cheese, and not unfrequently irreparable damage and loss.

At the Onondaga salt works there has been made for a few years past an excellent article of dairy salt, put up expressly for dairy use, and answering all the purposes of the Ashton, or best brands of European salt.

It will be well, therefore, for the cheese manufacturer to be particular in the selection of his salt, and it may be added, also, his rennets and annatto, that they have no defects or impurities, otherwise serious losses may perhaps result from the use of an inferior article.

Quantity of Cheese per Gallon of Milk.

In family cheese making there is considerable difference in the quantity of cheese produced by different persons from a given quantity of milk. A skillful manufacturer should, during the season, average a pound of pressed curd from a gallon of milk, *wine* measure, or a pound of *cured cheese* from a gallon of milk, *beer* measure. When at the Rome factories in June, 1862, I was told that 600 cows were then producing daily about 1,450 *wine gallons* of milk, which turned off 1,250 pounds of pressed curd. The curd at this factory was divided up and pressed into eight cheeses. At another factory, where the milk of some 400 cows was used, the produce was 965 gallons, beer measure, making 1,120 pounds of pressed curd, or about 115 pounds of curd to 100 gallons of milk, though I was told the quantity of curd varied from day to day, some days being several pounds less than in the proportion above stated. At this factory the curd was divided up into four cheeses of about 280 pounds each. The shrinkage on the cheese while curing, in the first factory mentioned, would average, it was said, about five per cent. Milk, of course, varies in quality at different seasons of the year. In the fall, as the quantity decreases, it is richer, and some cheese manufacturers deem its condition too thick to be worked with the best advantage into cheese, they therefore thin it down by adding water at the rate of one gallon water to ten gallons milk. This dilution, it is claimed, produces a better curd with less liability of losing butyraceous particles in working, etc.

Boxes, Weighing, etc.

At the factories much care is taken to have the packages neatly and substantially made.

This may not seem important to some, yet it really has its bearing on sales and in marketing. The purchaser judges, and with some reason, too, that

if the packages are clean and neatly put up, the contents also have received careful attention; besides, the eye is pleased, and a favorable impression created, which has more or less influence in satisfying the mind that all is as it should be.

The factory boxes, for the most part, are planed smooth and have an extra band about the bottom, firmly nailed, the whole showing taste and careful workmanship. This extra band or rim costs but a trifle, but serves to protect the box from breakage while being conveyed to market. Cheeses are often broken and marred when put up in slightly made boxes, and will not bear the rough handling which they often receive, and the result is that they arrive in market in an untidy and damaged condition.

Every package is weighed at the factory, neatly marked, and its weight received by the purchaser at the factory mark. This, on an average, will result in a gain to the manufacturer of from one to two pounds on every package, since, when cheese is weighed at the freight depots, so great often is the press of business that insufficient time is taken to determine the true weight, and the rapid down weight on each cheese gives many times a less number of pounds in the aggregate than there really is.

Of course there is no intention on the part of the weigher in making this so, but it results from haste to accomplish much work in a given time; for under our system of marketing, where cheese is made in families, often as many as 200 loaded wagons, on market days, are in waiting to deliver their loads.

A fancy box is sometimes made by cutting the hoops out of birch, planing smooth, and giving them a coat of varnish. Some appropriate device is also stamped on the box, under which is the manufacturer's name or initials.

Proximate Acidity of Milk for Fine Cheese.

The requisite degree of acidity in milk for producing the best results in cheese manufacture, has not been treated by American writers on the dairy, and is very imperfectly understood by most dairymen.

Experienced cheese makers have observed the fact that milk which has been cooled down to a low temperature, and kept very sweet, requires more rennet to form the curd, and when coagulated is longer in cooking, and often will not work down firm, but will be soft and spongy, and forming what is termed "a honeycomb cheese." Many times a superabundance of whey is retained, and cannot be pressed out; this soon becomes sour and putrid, the cheese does not cure evenly, but goes on depreciating in quality until it reaches a high state of decomposition, giving off an offensive odor, and not unfrequently requiring immediate removal from the shelves to the pig pen. When cheeses swell and puff up, the whey oozes out, carrying a portion of the butyraceous matter changed to oil, and are saved with difficulty, and when saved cannot be marketed at half the ordinary price of good cheese.

The principal features of this character of cheese are given that it may be identified, and because large quantities are annually made during spring and fall, many dairymen not knowing where the trouble lies or how to obviate the difficulty.

Now this results from manufacturing from milk that is *too sweet*, and which should have been treated with sour whey. The use of sour whey in cheese manufacture, when the temperature of the evening's milk has been kept low, we deem of imperative necessity, if uniform, firm cheese of firm quality be desired. It may be observed that milk should never have acquired sensible acidity at the time for setting with rennet, but should nevertheless be well on its way towards that point. By sensible acidity, we mean acidity that can be detected by the taste or smell. Some milk is more acid than other, soon after being drawn from the cow, and often *when freshly drawn* will redden litmus paper, yet to the taste is perfectly sweet. The milk from cows at pasture and fed with whey or slops is more acid than that from those which get nothing but grass on sweet upland pastures. But if by chance or accident the milk is sensibly changed when about to be made into cheese, it should be set at a low temperature, and all the subsequent operations hastened as far as practicable.

Could there be some simple instrument devised for determining the acidity of milk, it might be used with much advantage in cheesemaking. The most practical method, and one which we now employ, is by testing the evening's milk in the morning by the thermometer. This, with experience and close observation, will serve as a tolerable guide for conducting operations.

Our remarks on the use of sour whey, it may be observed, are more applicable to family cheese making than to factory manufacture, since there are various causes to hasten acidity in factory milk, and it is impossible to watch the milk as thoroughly as where it is under the immediate eye of the manufacturer from the moment it is drawn from the cow until turned into cheese.

Application of Sour Whey.

When the evening's meal of milk stands in the morning at or below 62 deg., the morning's milk may be added to it, and at the time of putting in the rennet a quantity of sour whey should be added and stirred into the mass, in the proportion of two quarts whey for every 60 or 70 gallons of milk. If the night's milk stands below 60 deg., a larger quantity of whey may be used, and the quantity of whey always graduated according to the degree of sweetness of the milk. If the evening's meal of milk stands at or above 65 deg. in the morning, no sour whey need be used, as the milk is on its way towards a change, or has acquired sufficient acidity to render the use of the whey not only unnecessary, but a damage from an excess of acid.

When milk has not been treated with sour whey at the time of adding the rennet, and there is difficulty in cooking the curd, it will be better to add to the mass, while cooking, a sufficient quantity of sour whey to harden up the curd; but it is always better, when practicable, to use the whey at the time of setting the cheese, as by that means the coagulation is rendered more perfect, while more of the butyraceous matter is retained, and the cheese consequently richer and of finer texture and flavor.

When acid is used in this way to assist the rennet in its work of coagulation, it passes off in the whey and in pressing and in the cheese room,

leaving the cheese sweet, mild, firm, rich, and of the finest texture. It has none of the characteristics of cheese made from milk sensibly sour, as in that case it will be hard and retain an acid taste.

In hot weather there will be no occasion to use the whey, unless the milk is cooled down with running water and ice at a low temperature, and so held through the night. We may remark here, that it is presumed the milk room, dairy utensils, &c., are to be kept *sweet and clean*, for if otherwise, it will be useless to attempt to have uniformity of manufacture; for no degree of skill in manufacture will be able to counteract all the damage done where the milk is constantly absorbing sour or putrid emanations, or where taints are received from unclean dairy utensils.

The whey should be distinctly acid, about like that coming from a sweet curd in summer weather and standing twenty-four hours. If the weather be cool, the whey must be kept in a warm atmosphere in order to acquire the requisite acidity.

Milk treated as above, with sour whey, will produce curd that will be all that can be desired; which will work down evenly and without trouble; the cheese curing with a firm, compact texture, retaining more of the butyraceous matter, and having that mild, rich, pleasant flavor peculiar to first class cheese. Attention to this matter and a little experience and observation in the use of the whey will, we are convinced, work a marked improvement in the quality of spring and fall cheese; while at the same time it will add in quantity, and save that which otherwise would go off in the whey and be lost.

Conclusion.

We have now presented the main features in the plan of associated dairying, and the various operations connected therewith.

Enough has been said, it is believed, for the reader to make up a satisfactory estimate as to its character and advantages. We do not propose advocating for or against the system, at least to dairymen of experience. Each individual and neighborhood can best determine whether the plan meets the wants of the particular person, or seems well adapted to this or that locality. But to those about commencing the business of dairying, who are inexperienced in the art of cheese manufacture, no plan seems better suited to the needs of such than this; since by employing an experienced manufacturer, they at once reach all the benefits and advantages of old dairy districts, and secure, at trifling expense, what it would take years to acquire, and at no inconsiderable outlay of capital.

In such communities there cannot be the slightest doubt but that the system of associated dairying is, for them, the best and the one to be adopted. Whether it will stand the test of years, and become general throughout old dairy districts, is a question which only time and experience can determine. So far the plan seems to work well, and promise good results; but it is new, and how much is due to novelty for its success, we, of course, are unable to state.

EXPERIMENTS WITH DIFFERENT DESCRIPTIONS OF MANURES IN THE GROWTH OF WHEAT.

In the Transactions for the years 1857, '58, '59, '60, we gave reports of experiments made by J. B. Lawes, F. R. S., F. C. S., and Dr. J. H. Gilbert, F. R. S., F. C. S., with different manures on permanent meadow land. And we had an opportunity, while in England, of visiting Mr. Lawes' farm, where these operations were carried on, and we were greatly gratified with our visit. The utmost care is taken in all the operations, and all the results are carefully recorded, and many most valuable facts are secured, and have been given to the world in the valuable reports made at Rothamsted, through the Royal Agricultural Society's Journal.

A report of experiments made at Rodmersham, Kent, by Messrs. Lawes and Gilbert, on the growth of wheat, by different descriptions of manure, for several years in succession on the same land, is here given. These experiments will be found of very great value. It is of the utmost importance to the farmer that he should be well informed on the subject of manures; and it will be found, on a careful examination of the various experiments made by Messrs. Lawes and Gilbert, that they have done much to enable the farmer rightly to judge as to the manure best adapted to the various soils and crops of the farm.

We also give a short treatise by Mr. Lawes on farm yard manure, as to its composition, which will be found of interest.

A very valuable report on the employment of Flemish manure, (night soil,) prepared for the municipality of Paris, is given. This is a subject attracting much attention in England and upon the continent. In the vicinity of our large towns it is also being considered, and it is worthy of all attention. We give a discussion before the London Central Farmers' Club, on town sewerage in connection with this, which contains much valuable information.

Following these reports is a very valuable article on "Destructive Insects and the Immense Utility of Birds," by Frederick De Tschudi, President of the Agricultural Society of Canton St. Gall, Switzerland. We bespeak for this very valuable work the careful attention of every farmer and horticulturist in our country; and we would ask of sportsmen, *spare the birds.*

B. P. J.

Report of Experiments made at Rodmersham, Kent, on the Growth of Wheat, by Different Descriptions of Manure, for Several Years in Succession, on the Same Land.

BY J. B. LAWES, F. R. S., F. C. S., AND DR. J. H. GILBERT, F. R. S., F. C. S.

[From Royal Agricultural Society's Journal.]

It is highly desirable, in a practical as well as scientific point of view, to determine, by means of careful experiments, whether or not the action of particular manures on particular crops is substantially similar in different descriptions of soil, and in different localities. With a view to provide information on this subject, a series of experiments was commenced in 1851 by Mr. Keary, on the home farm of the Earl of Leicester, at Holkham, in Norfolk; the results of which were published in this Journal in 1855 (vol. xvi., part 1). The crop selected was wheat, and the arrangement of the manures was the same as on some of the most important plots in the experimental field here at Rothamsted, (Herts,) in which wheat has been grown every year since 1844. Sir John M. Tylden, who is the president of an agricultural club in the neighborhood of Sittingbourne, in Kent, the members of which are accustomed to make visits of inspection of experimental or good practical farming, some years ago induced the club to pay such a vist to Rothamsted; after which they very liberally undertook to conduct, at their own expense, a series of experiments on the growth of wheat, the results of which would compare with those already obtained at Holkham, and with those of the experiments still in progress here at Rothamsted.

Accordingly a field of three acres and a half at Rodmersham, about three miles and a half from Sittingbourne, was set apart for the purpose, and divided into seven plots of half an acre each, and the superintendence of the experiments was confided to Mr. George Eley, of Tong, who is the secretary of the club.

The soil of the experimental field is described by Mr. Eley as "a mixed clay, upon a chalk subsoil, lying from four to six feet below the surface." The previous course of crops and management had been as follows: In 1853 turnips, dressed with 2 cwts. guano and 3 cwts. superphosphate of lime per acre, and the whole of the crop fed on the land; in 1854, barley; and a good dressing of London dung for beans in 1855; this being the usual preparation for wheat in that locality. The land was, therefore, to use Mr. Eley's words, "in a well cultivated and fertile state." It was, in fact, as the results will show, in higher condition than was desirable when the object was to determine the character of the exhaustion, and therefore the character of the manures required for the crop, in that particular soil, under the ordinary system of cropping and management adopted. The action of the different manures was, however, sufficiently characteristic after the first crop of wheat had been taken.

The manures were always mixed at Rothamsted, from the same stocks as those employed for the Rothamstead experiments. The arrangement of the

experiments, and the description and quantities of manure applied per acre, were as follows:

Plot 1. Unmanured.

Plot 2. Mixed mineral manure, composed of 300 lbs. sulphate of potass, 200 lbs. sulphate of soda, 100 lbs. sulphate of magnesia, 200 lbs. bone-ash and 150 lbs. sulphuric acid* (superphosphate of lime).

Plot 3. Ammonia salts, comprising 200 lbs. sulphate of ammonia and 200 lbs. muriate of ammonia.

Plot 4. "Ammonia salts," (as plot 3,) and "mixed mineral manure," (as plot 2).

Plot 5. 540 lbs. Peruvian guano.

Plot 6. 2,000 lbs. rape cake.

Plot 7. 14 tons farm yard manure.

The above quantities were applied annually for the first three years of the experiment; the arrangement was also the same for the fourth year, with the exception that in experiments two and four the quantities of sulphate of potass was reduced from 300 to 200 lbs., and of sulphate of soda from 200 to 100 lbs. per acre. In the fifth and sixth seasons the crop was grown without any fresh application of manure.

By means of experiment one, we ascertain the state of productiveness of the land without any manure, and so provide a standard by which to compare the effects of the different manures. By means of experiments two, three, four, six and seven, it is ascertained whether a specially mineral, nitrogenous or carbonaceous manure, or some combination of them, is the most effective; and by means of the guano (experiment five), which is the cheapest so-called artificial manure, containing a large proportion both of nitrogen and phosphates, we are enabled to judge whether increase of crop can be obtained profitably by the use of such a combination.

The results obtained in each of the four years in which the manures were applied, in the two succeeding years without manure, and over the total period of six years, are given in a series of tables as follows, (pp. 261–265.)

Table I.—The dressed corn per acre in bushels and pecks, and the total corn per acre in pounds.

Table II.—The straw, (chaff, &c.,) per acre, in pounds, and the total produce, (corn and straw,) per acre, in pounds.

Table III.—The increase, per acre, by manure, of dressed corn (bushels and pecks) and of total corn, pounds.

Table IV.—The increase per acre of straw (chaff, &c.) in pounds, and the increase of total produce (corn and straw) in pounds.

Table V.—The weight, per bushel, of dressed corn, and the proportion of corn to 100 of straw in the produce, and in the increase by manure.

In the first year of the experiments the unmanured plot gave about 32½ bushels of dressed corn, and nearly 43 cwts. of straw per acre. The farm yard manure gave only about 30⅞ bushels of dressed corn, but rather more than 56 cwts. of straw; and the greatest increase obtained by any of the manures was between four and five bushels of dressed corn, and between 15 and 16 cwts. of straw. It is obvious that, even unmanured, the condition

* Sp. gr. 1.7.

Experiments Made at Rodmersham, Kent, on the Growth of Wheat by Different Descriptions of Manure, Year after Year, on the same Land.

TABLE I.—*Produce per Acre of Dressed Corn in bushels and of Total Corn in lbs.*

Experiments.	Manures applied* for 1856-7-8-9. (Unmanured in 1860 and 1861.)	Produce per Acre. Each year. 1856	1857	1858	1859	1860	1861	Total. 4 years. 1856–9	2 years. 1860–1	6 years. 1856–1	Average annual. 4 years. 1856–59	2 years. 1860–1	6 years. 1856–61
	Dressed Corn—Bushels and Pecks.												
1	Unmanured	32 1¼	25 1	24 3½	19 3	7 1	15 2	102 0½	22 3	124 3½	25 2¼	11 1⅛	20 8¼
2	Mixed mineral manure	33 0¼	29 3½	29 1¾	21 2¾	13 0½	17 3½	114 0	31 0	145 0	28 2	15 2	24 0⅜
3	Ammonia salts	36 3½	34 2¼	31 0	23 1	15 3	19 1½	125 3	35 0½	160 3½	31 1⅜	17 2½	26 3¼
4	Mixed mineral manure and ammonia salts	33 2¾	41 0	32 1½	27 0	18 0	21 1⅜	133 3⅜	39 1⅜	173 1½	33 2	19 2⅜	28 3½
5	Guano	36 2	38 3	31 3½	25 0	17 1	21 0¼	132 0¾	38 1¼	170 1¼	33 0	19 0½	28 1½
6	Rape cake	37 0½	37 0½	33 0½	27 0½	16 0	21 1	134 1½	37 1	171 2½	33 2½	18 2½	28 2½
7	Farm yard manure	30 2½	33 0½	32 3½	25 2	14 1	19 3¼	122 0½	34 0¼	156 0¾	30 2½	17 0	26 0¼
	Total Corn—Lbs.												
1	Unmanured	1,959	1,602	1,501	1,199	462	1,032	6,261	1,494	7,755	1,565	747	1,292
1	Mixed mineral manure	1,975	1,934	1,815	1,314	807	1,171	7,038	1,978	9,016	1,760	989	1,503
3	Ammonia salts	2,204	2,190	1,883	1,392	917	1,245	7,669	2,162	9,821	1,917	1,081	1,638
4	Mixed mineral manure and ammonia salts	1,950	2,570	1,941	1,620	1,096	1,395	8,081	2,491	10,572	2,020	1,246	1,762
5	Guano	2,112	2,446	1,927	1,508	1,006	1,371	7,993	2,377	10,370	1,998	1,189	1,728
6	Rape cake	2,233	2,316	2,008	1,621	932	1,412	8,178	2,344	10,522	2,045	1,172	1,754
7	Farm yard manure	1,822	2,114	2,026	1,537	864	1,288	7,499	2,152	9,651	1,875	1,076	1,608

* For full particulars of the manures, see p. 270.

TABLE II.—*Straw, and Total Produce (Corn and Straw) per Acre—lbs.*

Experiments.	MANURES APPLIED * FOR 1856-7-8-9. (Unmanured in 1860 and 1861.)	PRODUCE PER ACRE. EACH YEAR. 1856	1857	1858	1859	1860	1861	TOTAL. 4 years. 1856-9	2 years. 1860-1	6 years. 1856-61	AVERAGE ANNUAL. 4 years. 1856-9	2 years. 1860-1	6 years. 1856-61
	STRAW (CHAFF, &c.)—LBS.												
1	Unmanured	4,798	2,486	2,691	3,395	1,624	1,833	13,370	3,457	16,827	3,343	1,728	2,805
2	Mixed mineral manure	6,274	3,154	3,093	3,277	2,338	2,309	15,798	4,647	20,445	3,949	2,323	3,408
3	Ammonia salts	6,528	4,350	3,825	4,451	2,686	2,795	19,154	5,481	24,635	4,788	2,741	4,106
4	Mixed mineral manure and ammonia salts	6,490	5,310	5,098	5,887	3,028	2,889	22,785	5,917	28,702	5,696	2,958	4,783
5	Guano	6,348	4,834	4,712	5,408	3,011	2,780	21,302	5,791	27,093	5,326	2,896	4,516
6	Rape cake	6,430	4,458	3,809	4,988	2,715	2,854	19,685	5,569	25,254	4,921	2,784	4,209
7	Farm yard manure	6,302	3,234	3,835	4,264	2,629	2,984	17,635	5,613	23,248	4,409	2,807	3,875
	TOTAL PRODUCE (CORN AND STRAW)—LBS.												
1	Unmanured	6,757	4,088	4,192	4,594	2,085	2,865	19,631	4,950	24,581	4,908	2,475	4,097
2	Mixed mineral manure	8,249	5,088	4,908	4,591	3,145	3,480	22,836	6,625	29,461	5,709	3,313	4,910
3	Ammonia salts	8,732	6,640	5,708	5,842	3,603	4,040	26,822	7,643	34,465	6,706	3,822	5,744
4	Mixed mineral manure and ammonia salts	8,440	7,880	7,038	7,507	4,123	4,284	30,865	8,407	39,272	7,716	4,204	6,545
5	Guano	8,460	7,280	6,639	6,916	4,017	4,151	29,295	8,168	37,463	7,324	4,084	6,244
6	Rape cake	8,663	6,774	5,816	6,610	3,646	4,266	27,863	7,912	35,775	6,966	3,956	5,963
7	Farm yard manure	8,124	5,348	5,861	5,801	3,493	4,272	25,134	7,765	32,899	6,284	3,883	5,483

* For full particulars of the manures, see p. 270.

TABLE III.—*Increase per Acre by Manure: Dressed Corn, bushels, and Total Corn, lbs.*

Experiments.	Manures applied * for 1856-7-8-9. (Unmanured in 1860 and 1861.)	Increase per Acre.											
		Each Year.						Total.			Average Annual.		
		1856	1857	1858	1859	1860	1861	4 years. 1856-9	2 years. 1860-1	6 years. 1856-61	4 years. 1856-9	2 years. 1860-1	6 years. 1856-61
	Dressed Corn—Bushels and Pecks.												
2	Mixed mineral manure	0 3½	4 2½	4 2	1 3⅜	5 3½	2 1½	11 3½	8 1	20 0½	2 3⅜	4 0½	3 1¼
3	Ammonia salts	4 2¾	9 1½	6 0⅜	3 2	8 2	3 3½	23 2½	12 1½	36 0	5 3½	6 0⅜	6 0
4	Mixed mineral manure and ammonia salts	1 1	15 3	7 2½	7 1	10 3	5 3½	31 3½	16 2⅜	48 2	7 3⅜	8 1½	8 0½
5	Guano	4 0⅜	13 2	7 0	5 1	10 0	5 2½	29 3⅜	15 2½	45 2	7 1¾	7 3	7 2½
6	Rape cake	4 3	11 3½	8 1	7 1½	8 3	5 3	32 0⅜	14 2	46 2⅜	8 0	7 1	7 3¾
7	Farm yard manure	1 2⅜	7 3½	8 0½	5 3	7 0	4 1½	20 0	11 1½	31 1½	5 0	5 2½	5 1
	Total Corn—Lbs.												
2	Mixed mineral manure	16	332	314	115	346	139	777	484	1,261	195	242	211
3	Ammonia salts	245	588	382	193	455	213	1,408	668	2,076	352	334	346
4	Mixed mineral manure and ammonia salts	9	968	440	421	634	363	1,820	997	2,817	455	499	470
5	Guano	153	884	426	309	544	339	1,732	883	2,615	433	442	436
6	Rape cake	274	714	507	422	470	380	1,917	850	2,767	480	425	462
7	Farm yard manure	137	512	525	338	402	256	1,238	658	1,896	310	329	316

* For full particulars of the manures, see p. 270.

TABLE IV.—*Increase per Acre by Manure: Straw, and Total Produce (Corn and Straw)—lbs.*

Experiments.	MANURES APPLIED * FOR 1856-7-8-9. (Unmanured in 1860 and 1861.)	INCREASE PER ACRE.											
		EACH YEAR.						TOTAL.			AVERAGE ANNUAL.		
		1856	1857	1858	1859	1860	1861	4 years. 1856–9	2 years. 1860–1	6 years. 1856–61	4 years. 1856–9	2 years. 1860–1	6 years. 1856–61
	Straw (Chaff, &c.)—lbs.												
2	Mixed mineral manure	1,476	668	402	118	715	476	2,428	1,190	3,618	606	595	603
3	Ammonia salts	1,730	1,864	1,134	1,056	1,063	962	5,784	2,024	7,808	1,445	1,013	1,301
4	Mixed mineral manure and ammonia salts	1,692	2,824	2,407	2,492	1,404	1,056	9,415	2,460	11,875	2,353	1,230	1,978
5	Guano	1,550	2,348	2,021	2,013	1,388	947	7,932	2,334	10,266	1,983	1,168	1,711
6	Rape cake	1,632	1,972	1,118	1,593	1,091	1,021	6,315	2,112	8,427	1,578	1,056	1,404
7	Farm yard manure	1,504	748	1,144	869	1,005	1,151	4,265	2,156	6,421	1,066	1,079	1,070
	Total Produce (Corn and Straw)—Lbs.												
2	Mixed mineral manure	1,492	1,000	716	3	1,060	615	3,205	1,675	4,880	801	838	813
3	Ammonia salts	1,975	2,452	1,516	1,248	1,518	1,175	7,191	2,693	9,884	1,798	1,347	1,647
4	Mixed mineral manure and ammonia salts	1,683	3,792	2,846	2,913	2,038	1,419	11,234	3,457	14,691	2,808	1,729	2,448
5	Guano	1,703	3,192	2,447	2,322	1,932	1,286	9,664	3,218	12,882	2,416	1,609	2,147
6	Rape cake	1,906	2,686	1,624	2,016	1,561	1,401	8,232	2,922	11,194	2,058	1,481	1,866
7	Farm yard manure	1,367	1,260	1,669	1,207	1,408	1,407	5,503	2,815	8,318	1,376	1,408	1,386

*For full particulars of the manures, see p. 270.

TABLE V.—*Weight per Bushel of Dressed Corn, and Proportion of Corn to Straw.*

Experiments	MANURES APPLIED * FOR 1856-7-8-9. (Unmanured in 1860 and 1861.)	EACH YEAR.						AVERAGE.			IN THE INCREASE OF PRODUCE.		
		1856	1857	1858	1859	1860	1861	4 years. 1856-9	2 years. 1860-1	6 years. 1856-61	4 years. 1856-9	2 years. 1860-1	6 years. 1856-61
	Weight of Dressed Corn per Bushel—Lbs. and Tenths.												
1	Unmanured	59.5	61.5	59.0	57.5	54.0	61.3	59.4	57.7	58.8	....	....	....
2	Mixed mineral manure	58.8	63.0	60.5	58.0	54.3	60.5	60.1	57.4	59.2	....	....	....
3	Ammonia salts	58.3	61.5	58.8	55.3	53.5	57.8	58.5	55.7	57.5	....	....	....
4	Mixed mineral manure and ammonia salts	56.9	60.3	58.0	56.0	56.3	60.8	57.8	58.6	58.1	....	....	....
5	Guano	56.9	61.0	58.3	55.0	53.8	58.8	57.8	56.3	57.3	....	....	....
6	Rape cake	59.4	60.3	59.5	56.5	54.0	61.5	58.9	57.5	58.5	....	....	....
7	Farm yard manure	58.3	62.3	60.5	57.8	54.0	60.5	59.7	57.3	58.9	....	....	....
	Proportion of Corn to 100 of Straw.												
1	Unmanured	40.8	64.4	55.8	35.2	28.3	56 3	46.8	43.2	46.1	....	....	....
2	Mixed mineral manure	31.5	61.3	58.7	40.1	34.5	50.7	44.5	42.6	44.1	32.0	40.7	34.9
3	Ammonia salts	33.8	50.3	49.2	31.3	34.1	44.6	40.0	39.4	39.9	24.3	33.0	26.6
4	Mixed mineral manure and ammonia salts	30.1	48.4	38.1	27.5	36.2	48.3	35.5	42.1	36.8	19.3	40.5	23.7
5	Guano	33.3	50.6	40.9	27.9	33.4	49.3	37.5	41.1	38.3	21.8	37.8	25.5
6	Rape cake	34.7	52.0	52.7	32.5	34.3	49.5	41.5	42.1	41.7	30.4	40.2	32.8
7	Farm yard manure	28.9	65.4	52.8	36.1	32.9	43.2	42.5	38.3	41.5	29.0	30.5	29.5

* For full particulars of the manures, see p. 270.

of the land was almost as high as was compatible with the healthy growth and proper ripening of the crop; that it was, in fact, scarcely in a state to require manure at all, and therefore not in a condition to show very prominently the characteristic action of the different manures employed. The best preparation would have been to grow a crop of wheat over the whole field without manure, before commencing with the special manures. It is unfortunate, too, that the manures were only applied during four consecutive years; that during the two succeeding years, without manure, the seasons were very unfavorable, and the land had become somewhat foul; and that the experiments were entirely stopped before the influence of the manures had ceased, and their whole effect been ascertained.

Notwithstanding the unfavorable circumstances above mentioned, the results of the experiments at Rodmersham are very valuable; and taking into consideration the very different condition of the land, they are entirely confirmatory of the conclusions that have been arrived at from experiments made at Rothamsted and elsewhere, regarding the character of the manures required for the increased growth of wheat on land under the ordinary conditions of cropping and cultivation in our rotations. They are, moreover, perfectly consistent with the experience of common practice on the point.

It is worthy of remark, that after the land had been well dunged, and grown a crop of beans, the greatest increase, especially of corn, obtained in the first year was where the manure was the most nitrogenous. Thus, the ammonia salts alone, the guano, and the rape cake, each gave four to five bushels increase of dressed corn; whilst the mineral manure and the mineral manure and ammonia together, gave only about one bushel. The ammonia salts alone also gave rather more increase of straw than any of the other manures—more even than the mixed mineral manure and ammonia salts together. The produce of the unmanured plot in the second and succeeding years showed, however, that the condition of the land had then become reduced; and it is, therefore, from the average results of each of the different manures taken over a series of years, that we shall be able best to judge of the character of the exhaustion induced by the growth of the wheat crop in that particular soil.

It is proper to make a few comments: First, on the produce during the four years of the application of the manures; secondly, on that of the two years after the cessation of the manuring, showing the influence of the residue of the manures previously applied, and then on the total amount of increase obtained in the six years by the different manures.

PLOT I.—UNMANURED.

As already observed, the produce without manure was, in the first year, about 32½ bushels of dressed corn, and nearly 43 cwts. of straw. In the five succeeding years it was, respectively, 25¼, 24¾, 19¾, 7¼, and 15½ bushels of dressed corn, and about 22½, 24, 30½, 14½ and 16½ cwts. of straw. But a part only of this great reduction in the produce was due to the reduction of the condition of the land as affected by previous manuring; for, as already said, in the last two years of the experiments, the seasons were unfavorable and the land had become somewhat foul. Excluding the first year, the average produce of the next three years was 23¼ bushels of dressed corn,

and 25½ cwts. of straw; and the average of the five years, without manure, that is, excluding the first year and including the last two unfavorable seasons, was 18½ bushels of dressed corn, and 21½ cwts. of straw. Here at Rothamsted, Herts, where wheat had been grown without manure for a dozen previous consecutive years, the average produce of the same five seasons was 16 bushels of dressed corn and 14½ cwts. of straw, or 2½ bushels of dressed corn and seven cwts. of straw less than at Rodmersham, Kent. But as a standard by which to compare the effects of the different manures during the four years of their application in the Kent experiments, it will be necessary to take the average of the first four years without manure, which was 25½ bushels of dressed corn and about 30 cwts. of straw; against which there were at Rothamsted, Herts, over the same seasons, only 17⅜ bushels of dressed corn and about 15½ cwts. of straw, or not much more than two-thirds as much corn and half as much straw as at Rodmersham.

PLOT II.—MIXED MINERAL MANURE.

This manure supplied potass, soda, lime, magnesia, phosphoric acid and sulphuric acid; in fact, an abundance of nearly all the constituents required by the crop, excepting silica. The average annual increase it yielded, over the four years of its application, was about three bushels of dressed corn and 5½ cwts. of straw. This was almost precisely the same amount of increase of corn as was yielded by the same manures over the same seasons here at Rothamsted, but nearly four cwts. more straw.

PLOT III.—AMMONIA SALTS ALONE.

The quantity employed contained much more nitrogen than could be taken up by the increase of produce, and quite as much as can be employed for the average of soils and seasons without getting an over-luxuriant and laid crop. The average annual increase yielded over the four years of the application was about six bushels of dressed corn and nearly 13 cwts. of straw. This, again, was almost exactly the same increase of corn, but nearly twice as much increase of straw, as was obtained by the same manure, in the same seasons at Rothamsted, after their application there for a dozen years consecutively.

Both at Rodmersham and at Rothamsted, then, ammonia salts alone increased the wheat crop, for a series of successive years, considerably more than did mineral manure alone.

PLOT IV.—MIXED MINERAL MANURE AND AMMONIA SALTS.

This manure supplied the same mineral constituents as in experiment two, and the same amount of ammonia or nitrogen as in experiment three; but it contained no carbon, of which about 40 per cent. of the dry substance of the crop consists. The average annual increase it yielded over the four years was about eight bushels of dressed corn and 21 cwts. of straw; or about five bushels more corn and 15½ cwts. more straw than by the mineral manure alone, and about two bushels more corn and eight cwts. more straw than by the ammonia salts alone.

It has been seen that both mineral manures alone, and ammonia salts alone, yielded almost identically the same amounts of increase of corn over

the first four years of the experiments at Rodmersham (Kent) as they did over the same years at Rothamsted, (Herts,) where wheat had been grown for a dozen previous consecutive years. The increase of straw by each of these manures used separately, was, however, greater in the Kent experiments than at Rothamsted. The effect was altogether different when the mineral and nitrogenous manures were used together. The combination yielded an average annual increase of about 21 bushels of corn and 22¼ cwts. of straw at Rothamsted, against only eight bushels of corn and 21 cwts. of straw at Rodmersham. Not only was the annual increase of both corn and straw the greatest at Rothamsted, but the actual produce per acre per annum of dressed corn was greater by about 5½ bushels, though that of the straw was about 13 cwts. less.

In both localities, then, the mixed mineral and ammoniacal manure greatly increased the crop, and the increase was greater when the two were used together than when each was used separately. But at Rodmersham, where the land was in comparatively high condition, the heavy manuring tended to over-luxuriance and excessive proportion of straw; whereas at Rothamsted, with an average of about half a ton less total produce per acre per annum, there was a considerably greater actual amount of corn, and of course a greater proportion of corn to straw, and also a greater increase of both corn and straw.

PLOT V.—GUANO.

The guano employed supplied a large quantity of phosphate of lime, small quantities of alkaline salts, and rather more than four-fifths as much ammonia or nitrogen as the quantity of ammonia salts of experiments three and four. It yielded an average annual increase of about one and a half bushels of dressed corn, and four and three-quarters cwts. of straw more than the ammonia salts alone; and only about half a bushel of dressed corn and three and one-quarter cwts. of straw less than the mixed mineral manure and ammonia salts together. It will presently be seen that the guano gave far more increase, in proportion to its cost, than any of the other manures.

PLOT VI.—RAPE CAKE.

The amount of rape cake employed would contain rather more nitrogen than the ammonia salts of experiments three and four, but in a condition in which it would be more slowly rendered available for the plant; it would contain a considerable quantity of mineral constituents; also a large amount of carbonaceous matter, yielding carbonic acid in the soil. It gave only the same average annual increase of corn (about eight bushels), and six and three-quarters cwts. less straw than the mixed mineral manure and ammonia salts (plot four), which contained a less total amount of nitrogen, and no carbonaceous matter whatever. This is perfectly consistent with results obtained at Rothamsted, which show the non-utility of supplying carbonaceous manure for wheat and other grain crops.

PLOT VII.—FARM YARD MANURE.

The quantity employed would contain more of every constituent, mineral and organic, than the crop to be grown; and it would supply a large amount of available silica, and a large amount of carbonaceous matter

beyond that of any of the other manures. Notwithstanding this, it gave, over the four years of its application, an average annual produce of about three bushels less dressed corn, and about eleven and a half cwts. less straw than the mixed mineral manure and ammonia salts; and about two and a half bushels less corn, and about eight and one-quarter cwts. less straw than the guano—neither of which would supply either silica or carbonaceous matter. This result is also perfectly consistent with that obtained at Rothamsted and elsewhere. It is not to be concluded from this, however, that the farmer may with impunity grow large white-straw crops by means of artificial manures without a due supply of farm yard manure to the land at some period of the rotation.

Thus the results obtained during the four years that the manures were applied showed that mineral manures increased the wheat crop but little, ammonia salts much more, mineral manures and ammonia salts used together more than either, or both, used separately; that Peruvian guano, containing both mineral and nitrogenous constituents, gave a considerable amount of increase; but that carbonaceous manures had no perceptible effect. They further showed that the condition of the land was higher than was desirable for the purposes of the experiments, the result of which was not only that the seasons set a limit to the amount of crops, and therefore to that of the increase produced, below that which the manures might otherwise have yielded, but that the increase consisted of a very undue proportion of straw.

The first season after the cessation of the manuring (1859, '60) was a very unfavorable one, and the produce on the permanently unmanured plot was only 7¼ bushels of dressed corn, and about 14½ cwts. of straw. The next season (1860, '61) was not very much better, and yielded, on the same plot, only 15½ bushels of dressed corn, and about 16½ cwts. of straw. But the whole of this decline of crop is not to be attributed either to gradual reduction of the condition of the land, or to the badness of the seasons; for, as already noticed, the land, which had for the first few years been very clean, had, by this time, become somewhat foul by the continuous cropping.

Although the produce of the continuously unmanured plot, which supplied the standard by which to compare that of the others, was so much less during these two concluding years of the experiments, the average increase of dressed corn on the other plots, due to the residue of the manures previously applied, was, in every case excepting that of the rape cake, even somewhat greater than during the seasons of the application. The increase of straw was, however, in every case excepting that of the farm yard manure, less than formerly, and generally very much less.

Thus, the amounts of increase obtained for two years after the application of the manures had been stopped, further show that the condition of the land was too high for the full action of the manures in the years of their application. They also show that their influence was not even then exhausted; and further evidence of this is to be found in the fact that calculation leads to the conclusion that in these Rodmersham experiments there was a less proportion of the nitrogen supplied in the manures in the four years, recovered in the increase of the six years, and in some cases

much less, than is sometimes recovered in the crop immediately succeeding the application of a nitrogenous manure. Under favorable circumstances, from forty to fifty per cent. of the nitrogen supplied in an artificial manure for wheat may be recovered in the increase of the first crop. But it is estimated that, in the cases of the rape cake and of the ammonia salts alone, there was only about one-fourth, and in those of the mineral manure and ammonia salts, and of the guano, under forty per cent. of the nitrogen supplied in the manure of the four years recovered in the increase of the six years.

It will be useful to give an estimate of the value of the increase so far obtained, by the side of the cost of the manures applied in one or two of the experiments.

The mixed mineral manures of plot two were far too expensive, in proportion to the amount of increase they yielded, for it to be at all worth while to reckon the cost against the increase in their case. Looking to the objects in view, it was still quite essential to have the evidence of direct experiment as to their effect.

Ammonia salts are, generally, neither so cheap a source of nitrogen, nor are they, when used alone, so good a manure for corn crops as Peruvian guano, which contains a large proportion of phosphates as well as nitrogen. Rape cake, though a recognized manure in the market for wheat, acts somewhat more slowly for the amount of nitrogen it contains than guano. It will be well, for the sake of comparison, to show the cost of the manure, and the value of the increase of the three manures—rape cake, ammonia salts and Peruvian guano. This is done in the following table:

TABLE VI.

MANURES APPLIED PER ACRE.			INCREASE OBTAINED PER ACRE.				COST OF MANURE.	VALUE OF INCREASE.	DIFFERENCE.
In 4 Years.			In 6 Years.						
			CORN.		STRAW.				
DESCRIPTION.	Quantities.	Price per ton.	Bushels.	Price per bush'l.	Cwts.	Price per cwt.			
	lbs.	£ s.		s. d.		s. d.	£ s. d.	£ s. d.	£ s. d.
Rape cake	8,000	5 10	46¾	7 0	75¼	1 3	19 12 10	21 1 4	1 8 6
Sulphate of ammonia....	800	15 00	36	7 0	69¾	1 3	12 10 0	16 19 2	4 9 2
Muriate of ammonia....	800	20 00							
Peruvian Guano.....	2,160	12 10	45½	7 0	91¾	1 3	12 1 1	21 13 2	9 12 1

Reckoning the value of the increase against the cost of the manures, there is a considerable margin in favor both of the ammonia salts and the guano, but particularly of the guano. The evidence further goes to show

that these active nitrogenous manures are by no means fully exhausted in the first year of their application. The quantity of guano used, nearly five cwts. to the acre, was, however, much more than is usually applied; indeed, much more than it is desirable to apply in ordinary practice. Nor should it be inferred from the plan and results of these experiments that the practice of growing a series of corn crops by means of artificial manures is to be recommended. But when these results are considered by the side of those obtained at Rothamsted, Holkham and elsewhere, and with the light of the common experience of almost every arable district of the country, the practical conclusion undoubtedly is, that highly nitrogenous manures much increase the produce of grain crops under the circumstances in which these are generally grown in our rotations.

Peruvian guano, which contains a large quantity of phosphates, as well as nitrogen yielding matter, is one of the best artificial manures for wheat; and two to three cwts. per acre, sown broadcast before the seed, and harrowed into the land, will generally be sufficient. When ammonia salts are used, about two cwts. per acre may be employed, and one to two cwts. of superphosphate of lime should at the same time be applied. The above quantities are such as should generally be employed when the grain crop is grown in the ordinary course of rotation, and the land is considered to be not highly enough manured to carry as heavy a crop as the average of seasons will well ripen.

But another great advantage to the farmer of the nitrogenous and phosphatic manures now in such general use, is, that provided the land be well dunged once in the course of the rotation, he may, without injury to it, by their means frequently take an extra grain crop in the course; for example, barley or oats after wheat, as the description and condition of the soil and the locality may indicate. In such cases one and a half times or twice as much of the artificial manure should be used as when the crop is grown in the ordinary rotation.

Farm Yard Manure.

BY J. B. LAWES, ESQ., F. R. S., F. C. S.*

[From the Royal Agricultural Society's Journal.]

Farm yard manure is generally looked upon as the natural manure of our crops. Artificial manures, on the other hand, are frequently supposed to be mere stimulants; and the very fact that but a small quantity of them may produce as much increase of crop as a very large quantity of farm yard manure, is brought as an argument against the use of artificial manures. A few observations upon the sources and the composition of farm yard manure may therefore be of service.

It is well known that the straw of our corn crops, and the solid and liquid excrements of horses and other animals fed in the stables, sheds and yards are the substances which contribute to form the heterogeneous mass called *farm yard dung*. Let us estimate what proportion of these various

* This short treatise, which is extracted from an unpublished pamphlet by the author's permission, will be found highly suggestive as to the economy of fertilizers. P. H. F.

matters will, under given circumstances, be included in the complex mass, and thence endeavor to arrive at some conclusion as to its composition.

Suppose the case of a farm of 400 acres formed on the four-course system; that half of the roots and 100 tons of hay are consumed at the homestead, and that the whole of the straw of the corn crop is retained at home as food and litter. Let it further be assumed that twelve horses have corn equal to ten pounds of oats per head per day, and that about ten shillings per acre are expended in the purchase of cake for feeding stock. Under these circumstances the succeding table shows the amounts of the matters enumerated entering into the home manures of the farm in the course of the year:

	Total dry matter.	Total mineral matter (ash).	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.	Nitrogen calculated as ammonia.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
100 acres roots: half the crop—6 tons per acre consumed at home, give as manure	29,568	7,741	1,686	2,411	2,512	3,050
100 acres barley: at 2,500 lbs. straw per acre; 1-5 reckoned as food, and 4-5 as litter, give as manure	193,333	11,138	916	1,574	1,213	1,473
100 tons of hay consumed at home, give as manure	94,080	14,818	2,267	3,124	3,808	4,624
100 acres of wheat: at 3,000 lbs. straw per acre; 1-5 reckoned as food, and 4-5 as litter, give as manure	235,200	14,850	1,634	1,948	1,746	2,120
Corn—43,800 lbs. of oats, consumed by horses, give as manure	7,534	1,198	487	216	745	905
20 tons of oil cake (linseed, rape, and cotton seed), consumed at home, give as manure	9,930	3,295	2,507	963	2,185	2,653
Total	574,645	53,040	9,497	10,236	12,209	14,825

These are, as near as can be reckoned, the average amounts of the constituents that would contribute to the home manure of the farm annually. But farm yard manure in the fresh state, and before it has gone much into decomposition, contains about seventy per cent. of water, or seven parts of water to three parts of dry matter. The 574,645 pounds of dry matter would thus be combined with 1,340,838 pounds of water, making together 1,915,483 pounds=855 tons (or an average of about 8½ tons for each of the 100 acres of root crop) of *fresh undecomposed dung*. In this state its composition, per cent. and per ton, would be as follows:

	Total dry matter.	Total mineral matter.	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.	Nitrogen calculated as lime.
Per cent	30.0	2.77	0.50	0.53	0.64	0.77
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Per ton	67.2	62.0	11.1	12.0	14.3	17.3

This is the composition of the fresh undecomposed dung, calculated from the average composition of the matters which are supposed to enter into it.

The proportion of total *dry matter* given above is rather higher than the average of results obtained at Rothamsted with good box dung; it is also higher than the average of the results given by Boussingault; but is lower than the amount given by Professor Voelcker for fresh dung.

The amount of *mineral matter* found by analysis in farm yard manure is generally at least once and a half or twice as much as that contained in the clean food and litter, owing to the admixture of dirt. The amount of mineral matter in *fresh* dung due to the mineral constituents of the food and litter will probably seldom be much more than three per cent., but in rotten dung that has not wasted by drainage, it may be considerably more.

The calculated amount of *nitrogen* given above is almost exactly the mean of the results of Boussingault and Voelcker on fresh dung, but it is rather less than has been found at Rothamsted in good box dung.

But farm yard manure undergoes very considerable diminution by decomposition, and especially when carted out and formed into clamps. Hence the land would not receive so large a quantity of matter as has been above estimated. The amount of organic matter diminishes very considerably, and in rotten dung the proportion of water is generally higher than above supposed. It also too frequently happens that both mineral matter and nitrogen are allowed to go to waste by drainage or other mismanagement. Otherwise, as the organic matter diminishes, the amount both of mineral matter and of nitrogen should increase in proportion to a given weight of the manure.

The composition and value of the manure is also very dependent upon the quality of the food consumed by the animals that help to produce it. Thus, if the same amount of dung had been produced from the same materials above mentioned, *excluding the twenty tons of oil cake*, the yard of manure would have contained 2,185 pounds less of nitrogen, equal to 2,653 pounds, or considerably above a ton, less of ammonia; and every ton of the dung would have contained nitrogen equal to only about 14¼ pounds, instead of about 17¼ pounds of ammonia. In the one case the dung would be called poor, and in the other the farmer might congratulate himself on having a yard of moderately good dung. Yet the whole weight of dry substance added by the oil cake to each ton of dung would only be about 11 pounds! a quantity which is so small, that neither the man that loaded the cart nor the horse that drew the dung to the field, would detect it. If 40 tons instead of 20 tons of oil cake had been employed with the same amount of litter, only about another 11 pounds of dry substance would be added to each ton of the manure, but the yard of manure would then be equal in quality to rich box dung. In fact the consumption of £400 worth, or about 40 tons of cake, would only add about 10 tons of dry substance to the manure heap, whilst the weight of Peruvian guano obtained for the same money would be about 30 tons. It is quite immaterial to the growth of the crops whether the additional amount of nitrogen be purchased in the form of oil cake, and so supplied to the land in the farm yard manure, or whether it be purchased and applied in the form of artificial manure, provided only that the requisite mineral constituents are not wanting. It

is also a matter of indifference to the crops whether the necessary mineral constituents are supplied in the form of the excrements of animals or of artificial manures. The question is entirely one of economy, depending chiefly on the relative prices of meat and corn and of cattle foods and artificial manures.

Average composition, per cent. and per ton, of various kinds of Agricultural Produce, &c.

	PER CENT.					LBS. PER TON.				
	Total dry matter.	Total mineral matter (ash).	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.	Total dry matter.	Total mineral matter (ash).	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.
1. Linseed cake...	88.0	7.00	4.92	1.65	4.75	1,971	156.8	110.2	37.0	106.4
2. Cotton seed cake	89.0	8.00	7.00	3.12	6.50	1,994	179.2	156.8	70.0	145.6
3. Rape cake.....	89.0	8.00	5.75	1.76	5.00	1,994	179.2	128.8	39.4	112.0
4. Linseed.....	90.0	4.00	3.38	1.37	3.80	2,016	89.6	75.7	30.7	85.1
5. Beans	84.0	3.00	2.20	1.21	4.00	1,882	67.2	49.3	28.4	89.6
6. Peas	84.5	2.40	1.84	0.96	3.40	1,893	53.8	41.2	21.5	76.2
7. Tares.....	84.0	2.00	1.63	0.66	4.20	1,882	44.8	36.5	14.8	94.1
8. Lentils.....	88.0	3.00	1.89	0.96	4.30	1,971	67.2	42.3	21.5	96.3
9. Malt dust.....	94.0	8.50	5.23	2.12	4.20	2,106	190.4	117.1	47.5	94.1
10. Locust beans...	85.0	1.75	.....	.....	1.25	1,904	39.2	.....	.....	28.0
11. Indian meal....	88.0	1.30	1.13	0.35	1.80	1,971	29.1	25.3	7.8	40.3
12. Wheat	85.0	1.70	1.87	0.50	1.80	1,904	38.1	42.0	11.2	40.3
13. Barley.....	84.0	2.20	1.35	0.55	1.65	1,882	49.3	30.2	12.3	37.0
14. Malt.....	95.0	2.60	1.60	0.65	1.70	2,128	58.2	35.8	14.6	38.1
15. Oats.....	86.0	2.85	1.17	0.50	2.00	1,926	63.8	26.2	11.2	44.8
16. Fine pollard....	86.0	5.60	6.44	1.46	2.60	1,926	125.4	144.2	32.7	58.2
17. Coarse pollard..	86.0	6.20	7.52	1.49	2.58	1,926	138.9	168.4	33.4	57.8
18. Bran	86.0	6.60	7.95	1.45	2.55	1,926	147.8	178.1	32.5	57.1
19. Clover hay.....	84.0	7.50	1.25	1.30	2.50	1,882	168.0	28.0	29.1	56.0
20. Meadow hay...	84.0	6.00	0.88	1.50	1.50	1,882	134.4	19.7	33.6	33.6
21. Bean straw.....	82.5	5.55	0.90	1.11	0.90	1,848	124.3	20.2	24.9	20.2
22. Pea straw.....	82.0	5.95	0.85	0.89	.....	1,837	133.3	19.0	19.9	20.2
23. Wheat straw ...	84.0	5.00	0.55	0.65	0.60	1,882	112.0	12.3	14.6	13.4
24. Barley straw...	85.0	4.50	0.37	0.63	0.50	1,904	100.8	8.3	14.1	11.2
25. Oat straw	83.0	5.50	0.48	0.93	0.60	1,859	123.2	10.7	20.8	13.4
26. Mangel wurzel..	12.5	1.00	0.09	0.25	0.25	280	22.4	2.0	5.6	5.6
27. Swedish turnips	11.0	.68	0.13	0.18	0.22	246¼	13.4	2.9	4.0	4.9
28. Common turnips	8.0	.68	0.11	0.29	0.18	179½	15.2	2.5	6.5	4.0
29. Potatoes	24.0	1.00	0.32	0.43	0.35	537¼	22.4	7.2	9.6	7.8
30. Carrots	13.5	.70	0.13	0.23	0.20	302¼	15.7	2.9	5.1	4.5
31. Parsnips.....	15.0	1.00	0.42	0.36	0.22	336	22.4	9.4	8.1	4.9

Report on the Employment of Flemish Manure (Night Soil.)

Drawn up for the municipality of Paris by a committee appointed by the Agricultural Society of Lille, in answers to questions put to that committee by M. Huet, civil engineer of the Department "des Ponts et Charesseès," translated by P. H. Frere.

[From the Journal of the Royal Agricultural Society of England.]

FIRST QUESTION.

Can Flemish manure be employed exclusively, that is to say, can it entirely take the place of farm yard manure, rape cake, &c.?

On small occupations in the neighborhood of Lille, Flemish manure is often used with profusion, and almost exclusively; but in farms on a larger scale, there is rarely an attempt made to fertilize the soil with this alone.

There can be no progressive agriculture without stock, and consequently without straw manure. If, then, the proprietor makes use of a considerable proportion of this stable manure, he will do well to apply it in connection with the Flemish, rather than to use the latter on one part of his land, and the former separately on another. On our farms stable manure is applied to the same soil once in three or four years. Each part receives its portion in turn, on the recurrence of certain crops, and the Flemish manure is subsequently applied, either at the same point in the rotation, or the year following, according to circumstances. On strong lands, especially, it would be unreasonable to attempt to found a system of fertilization upon the exclusive use of night soil. Farm yard manure is not only valuable for the saline and nitrogenized matter it contains; it also acts admirably in improving the texture of clay soils. The straw helps to give to the land that porosity without which cultivation would be a delusion. Still more, there is no doubt but that the silica which it contains is in a state more favorable for assimilation by the cereals than that of the natural silicates.

From the results of direct experiments we are convinced that Flemish manure, employed alone, tends to give to the soil a solidity which repeated plowings would fail to remove.

On a farm in the neighborhood of Lille, it was thought possible to manure the crops entirely with night soil, two cows only being kept to 100 acres of land. During a few years things went on tolerably well, but it soon became evident that the corn *ran to leaf*. The stems did not attain their proper development, and the yield of corn was extremely deficient. The system was changed, and stock introduced on the farm; from that time farm yard manure was applied to the land, and soon the corn crops became equal to those which are generally seen in the Lille district.

The committee is, then, unanimous in concluding that liquid manure should not be exclusively used, especially on clay soils. Management so short-sighted would be liable to bring into discredit this most useful manure, which brings fertility and abundance wherever it is applied with discretion. Nevertheless, on light soils, it may occasionally be used alone, without harm, for a few years, and especially in the cultivation of kitchen gardens.

SECOND QUESTION.

Is Flemish manure suitable to some sorts of land rather than to others?

From what has been just stated it may be concluded that it suits all soils, provided that those which are most heavy receive at proper intervals other indispensable dressings. It will be understood that it is necessary to carry it out into the fields in dry rather than wet weather, that the carts may not do injury to the land. The farmer well knows that the porosity of the soil is the first essential to all productive agriculture.

Those of our farmers who make use of Flemish manure always construct, near to their fields, and on the edge of their roads, stone cisterns to serve as reservoirs. These cisterns measure from 1,000 to 7,000 cubic feet, according to the importance of the farm, and would consequently contain from 30 to 200 tons of water. The manure is brought from the towns when horses are not otherwise occupied, and in rainy weather when carts cannot be employed in the fields. It is then stored up, and when circumstances are favorable, and the land dry or hardened by frost, it is applied to the soil where required. By thus mixing materials collected in different places, a uniform liquid is obtained of a moderate density, the effect of which can be easily calculated.

We have ascertained by numerous experiments made upon the contents of these cisterns, that the specific gravity of Flemish manure, such as is employed in the neighborhood of Lille, is from two deg. to three deg. on Beaumé's gauge.

By a singular anomaly, the reservoirs for this manure, as ordinarily constructed in the open field, are included in the first class of unwholesome works, ("*etablissements insalubres;*") and as such are subject to formalities and fettered by restrictions which impede their formation. It is desirable that this rigorous law should be modified. Assuredly there is not one enlightened agriculturist—not one man of education—who would dare to maintain that the reservoirs for Flemish manure are sources of unhealthiness. At the worst, they are but a cause of slight annoyance to the passer-by at the moment when their contents are being taken out; but this drawback is clearly not worthy of serious consideration.

THIRD QUESTION.

Can Flemish manure be used for all sorts of crops—tobacco, beet root, corn, rape, flax, artificial grasses?

Flemish manure is used in this district for all sorts of crops with more or less profusion, and in many cases, if carefully managed, it may be applied in large quantities without injuring the quality of the produce.

Tobacco, when grown near towns, is often dressed with an abundant quantity of this manure; nevertheless the excise forbid the use of it, because it is supposed that it tends to produce leaves deficient in gum and difficult to dry. It is true that by applying, as was formerly very generally done, a profusion of Flemish manure between the rows of tobacco in full growth, a vigorous impulse is given to the vegetation, which lasts a long time. The leaf subsequently ripens with difficulty, and doubtless absorbs a large quantity of alkaline salts, which render it "hygrometic."* But if, on the contrary, the liquid manure is applied to the soil before the tobacco is transplanted, the leaves will prove of good quality, and the plant shoot vigorously, even though it grow in land long accustomed to this course of treatment. Thus, with the addition of farm yard manure and rape cake, about 2,900 gallons per acre of this fertilizer may, without inconvenience, be used.† There are, indeed, farmers who claim to have produced good

* That is to say, retentive of moisture, and an index of the varying amount of that moisture.

† These figures, as well as those that follow, must only be taken approximately. They necessarily vary according to the value of the manure, which the farmer calculates with more or less

tobacco crops by applying to the grounds destined for the plants as much as from 9,000 to 10,000 gallons per acre, besides the farm yard manure, taking care that three-fourths of the dressing should be applied in winter, and the remaining fourth in spring, before the young plants are put in.

For beet root, also, the sugar boilers in general forbid, and rightly, the use of liquid manure, especially if applied in excess. Nevertheless, near Lille, when the beet root does not succeed tobacco, night soil is applied, not only before the sowing, but—which is still more injurious to its saccharine properties—after it is up. It is impossible to speak positively as to the quantity used. The farmer is guided in this by his relations with the sugar manufacturers. If the crop promises to be abundant, it will be his object to improve its saccharine qualities, for fear he should not find sale for it, and then he manures in moderation. If, on the contrary, the plant is thin, and the demand active, he will take the opposite course, and the sugar will be made from vile roots, charged with salts, which sometimes completely prevent the crystallization of the sugary matter.

In the case of beet root grown for the stock, the farmer may give free course to his passion for fertilizing, and use liquid manure in profusion. This plant is often dressed with a proportion of from 4,500 to 5,500 gallons per acre, and it is not uncommon thus to obtain a produce of from thirty-two to thirty-six tons of roots per acre.

It is at the same time acknowledged that a moderate quantity of Flemish manure is not injurious to the saccharine qualities of beet root intended for sugar, provided always that it be applied to the soil before the crop is sown, and used in the place of a like quantity of rape cake and farm yard manure. It may even be said that by this plan the germination of the seed is often made more regular.

The seed of the beet has a very slightly developed perisperm (or kernel). The young plants, on first coming up, can draw but very little nourishment from their mothers-store. They are soon obliged to have recourse to the nutritive particles deposited in the soil, and if these are wanting they droop, and fall more or less a prey to insects. If, in the hope of saving the crop, the farmer then applies liquid manure, the plants which remain will acquire an unnatural growth, the roots will be of bad quality, and the crop very defective.

It follows, then, that for plants so constituted it is reasonable to manure before the sowing. There are, besides, many other reasons in favor of the practice. Wheat, which follows beet root, is often grown without manure; but if desirable, either in winter or spring, Flemish manure may be applied to give vigor to the more weakly part of the crop. It must be borne in mind that this manure is a most valuable auxiliary to all progressive agriculture. As a general rule, it is better to apply it before sowing, and with farm yard manure; but in any case, if it happens that a portion of the crop is in danger, it may often be saved by a moderate dressing. We may be sure that, without this auxiliary, agriculture would present many more chances of failure.

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exactness, and with the customs belonging to the locality or the particular property. Besides, allowance must always be made for the fertilising matters which remain in the soil, and whose amount depends on former crops, and the manures applied to them.

For the potato, farm yard manure is ordinarily applied in winter, and the land watered before planting with 1,450 gallons of Flemish manure per acre. This last is often used alone on small occupations, either before or after planting, in the proportion of 1,700 to 2,700 gallons per acre. For this plant, as for beet root, an excess of liquid manure is injurious. We obtain bulbs of good quality, solid and succulent, when the night soil has been applied in moderation before planting, in conjunction with farm yard manure; and, on the other hand, if Flemish manure be used alone, and spread between the rows of potatoes when in full growth, both quantity and quality will be defective.

As for rape, farm yard manure is applied at first, and the crop is watered with a proportion of 1,450 gallons of liquid manure per acre after planting, either in winter or spring.

For flax, farm yard manure is almost always used, with about 1,450 gallons of Flemish manure. It is advisable to spread this in winter some time before sowing.

Artificial grasses are watered fully with this manure. On the pastures of La Deule it is certain that, applied in winter or spring, it destroys noxious plants, such as moss, docks, &c., and gives new vigor to the grass.

Turnips, field cabbages, poppies, gold-of-pleasure, &c., are all likewise manured with night soil. Turnips generally follow flax; when the latter has had no farm yard manure, it is applied to the turnips, and they are watered besides with about 1,450 gallons of liquid manure per acre. This proportion may be doubled if no farm yard manure be used. They are sown in July and August. Cabbages require much manure; besides supplies from the farm yard, they receive often from 2,500 to 3,000 gallons of liquid manure per acre. Stable manure and about 3,000 gallons per acre of night soil constitute the usual preparation for poppies. A good crop of corn may follow without any further application to the soil. Gold-of-pleasure is sown at the end of the month of May, after the land has been watered with about 1,450 gallons of liquid manure per acre.

In the use of Flemish manure the farmer must be guided by the state of the atmosphere. If in winter the weather is wet, it is not desirable to cart over the land, and the application of the manure must be put off to a dry season. There is no profession in which it is so impossible to act on a fixed plan as in agriculture; external circumstances must always modify the intentions of the individual.

FOURTH QUESTION.

To which of the crops can Flemish manure be advantageously applied in the largest quantities?

From what has been said, evidently to tobacco, beet root (when intended for feed), artificial grasses, rape, cabbages and potatoes. We must mention also that all through the north of France Flemish manure is used in profusion in the cultivation of kitchen gardens, and yet our vegetables are certainly in no way inferior to those of other countries. Cauliflowers at Dunkirk are watered (*apatelés*) each with one or two quarts of this manure, and they have a wide reputation under the name of "*choux de Rosendael.*" Our asparagus is as delicate, our green peas as sweet as else-

where, although they have assimilated chemical constituents which, from the combination from which they are derived, inspire a foolish repugnance.

FIFTH QUESTION.

What quantity is it thought most advisable to use in the cultivation of wheat?

As we have already said, it is more common to manure the crop of roots or pulse which precedes the wheat than the wheat itself. If the wheat follow oats, the soil is often dressed with about 1,450 gallons of Flemish manure per acre, but this rotation is very rare.

SIXTH QUESTION.

Is it best to use Flemish manure before sowing or when the plant is up, and then by jet—which is the most useful practice?

On this head we can only repeat what we have already suggested. The manure must be applied to the soil according to circumstances; but if there be no practical objection, it is best done before sowing. There is no doubt but that the quality of the produce is improved by this means; and, on the other hand, Flemish manure applied to plants in full growth stimulates their development to an unnatural extent. Wheat tillers and runs to straw, to the injury of the grain; tobacco and beet-root produce rank foliage, and the maturity of the plant is delayed beyond the natural period.

The farmers of the north in general hold the opinion that the land must reach upon the manure, and make it undergo certain chemical changes before it will be in a fit state for assimilation by the plants. This opinion is also that of the most famous of modern agriculturists.

The agricultural committee of Lille, feeling a lively interest in the public good, cannot too strongly urge the authorities to take all necessary measures for furthering the use of night soil in all the rural districts of France. If the great value of this powerful fertilizer be taken into account, the childish prejudice which puts an obstacle to its use cannot be too much deplored.*

Attempts to distribute liquid manure throughout every section of a rural occupation by machinery and pipes are not to be condemned. A considerable outlay at the beginning may often save much subsequent expense in hard labor; and, besides, the distribution is thus effected in a regular manner and in due season. At the same time, the committee is of opinion that more may be done towards introducing the general use of night soil in agriculture by starting after the rough and primitive fashion of Flanders; that is, by conveying it in carts to the fields when the weather is suitable, and spreading it subsequently by means of scoops, or any other simple manner. The farmer unacquainted with the practice of the north, would see in this an undertaking quite within his means. If, on the contrary, he imagines that night soil cannot be made use of without expensive machinery, of which he could never dream of becoming the owner, he will abandon all idea of employing it, to his own loss as well as that of the commonwealth.

* Few persons are aware that under the blue sky of Nice the night soil is carefully collected to serve as manure. Our new countrymen use it for their vines, their orange trees, their violet plants, &c., which nevertheless does not hinder their oranges from being delicious, their grapes excellent, and their violets from forming the delight of their "*elegantes*," and the favorite perfume in whites for drawing rooms and boudoirs.

TOWN SEWAGE.

We are indebted to Alderman *I. J. Mechi*, of London, for a copy of the "Journal of the London Central Farmers' Club," containing the discussions on the subject of *Town Sewage*, introduced by Alderman Mechi. The evidence taken before Parliament on the subject is given—the experience of practical farmers and scientific gentlemen, in addition to the remarks of Alderman Mechi, also are presented. This discussion, together with the valuable article of *J. B. Lawes, Esq.*, on *Farm Yard Manure*, and the report on *Flemish Manure*, (night soil,) will give to our farmers much valuable information on the subject of manures. This subject of *Town Sewage* is attracting great attention, in England and upon the Continent, in the best cultivated districts. It is of equal importance to our country—and it is hoped these articles will receive that attention which they deserve from our farmers. J.

After a few opening remarks of Mr. Bradshaw, chairman,

Alderman Mechi said: There is a great lamentation just now because we can no longer manufacture for ourselves and the world at large our usual supply of cotton goods. We have not been used to this, but we have been used to import foreign food, and so we hear no complaint of our not producing our own food. We depend upon foreigners for one-third of our daily bread, and a good deal of our meat, cheese, eggs and butter. We do not ask ourselves if we could produce all this at home, and whether that production would not employ an amount of native labor and capital, with immense advantage to our country. Perhaps this evening's meeting may somewhat tend to remedy this national anomaly and discredit. There can be no reasonable doubt but that we have the means to produce our own food superabundantly, did we choose so to do. We are met again to discuss this "nasty" question of town sewage. I need not, however, any longer apologize for discoursing about it, for we are gradually beginning to accept the incontrovertible proposition that without manure we should have no food, and that, therefore, town sewage is to a great extent the life-blood of the nation. Public opinion has latterly greatly progressed and improved in regard to this matter. Editorial leaders, and correspondents' letters, in our public prints, discuss the subject; and that agricultural magician, Baron Liebig, again warns us of our impending danger; energetic gentlemen are promoting limited liability companies, to tap the new great sewers, and to convey their golden streams to distant and poverty-stricken farms. Our Metropolitan Board of Works is perplexed by conflicting claims for grants of the sewage; and on this point I hope that, in justice to the rate-payers, the Board will not allow itself to be hurried to a premature decision, or hastily part with its control over that which must ultimately prove to be a source of considerable revenue to rate-payers.

The public owe a deep debt of gratitude to Dr. Brady, M. P., for his exertions in this great cause, and for the mass of valuable evidence taken last session before a parliamentary committee, over which he so ably presided. Evidence was given by nearly every one who had practical experience as to sewage, and thus we have a mass of important and dependable facts to guide us to a correct conclusion. I shall have occasion to call your attention to this evidence. I was myself under examination for two and one-half hours; but as you are well acquainted with my views I shall not refer to my own evidence. Our government also issued a commission of inquiry, and practical experiments as to town sewage, at Rugby. The report is just out, and is very valuable. I shall also refer to it. I think we are all agreed that the great want of British agriculture is more manure—much more manure. On this point there is a remarkable unanimity among farmers. We may over-manure for our cereals, but never for our pastures, rye, grass, green root, and leguminous crops. It is impossible to take a railway trip through almost any district of the United Kingdom, without being convinced that it is only half manured, and that its powers of production might be greatly increased if our 50,000,000 of available acres could receive an extra manurial dressing. Employing at present merely a tenant's capital of £4 per acre, with a gross produce of £3 12s. per acre, the small increase of 10s. per acre would add £25,000,000 annually to our supply of human and animal food. The use of town sewage will render less necessary the purchase of guano and artificial manures, and it will diminish the necessity for purchasing foreign feeding stuffs as a source of manure. This is a very important consideration, for I know one Norfolk farmer who pays £3,000 annually for linseed cake alone; and another who, during his holding, has paid £70,000 for cake, and £50,000 for artificial manures, being equal to £100 per acre over his whole farm. We all know that we cannot feed our animals with purchased food, except at considerable loss, chargeable against their manure. I purpose to extract, as briefly as possible, from the parliamentary and government documents, as much of the valuable evidence as our limited time this evening will permit; but I would strongly recommend those who desire to master this question thoroughly, to procure and digest the whole evidence. It may be obtained for 2s. 11d., at the Parliamentary Paper Office, House of Commons, and is entitled, "First and Second Report on the Sewage of Towns, April and July, 1862." There were 4,606 questions asked and answered. The report of the government commission, just published, on the same subject, may also be obtained there, and is extremely valuable.

How will the Landlord's Interest be Affected by the Use of Town Sewage?

Will its use increase or diminish the value and fertility of his land at the end of a lease? The evidence which I shall quote, proves unmistakably how greatly it is to the landlord's interest to encourage and facilitate the application of town sewage to his estate, more especially on all dry, porous, or sandy soils. The once sandy wastes on the sea shore near Edinburgh, not then worth 5s. per acre, now produce an annual income of from £20 to £30 per acre, solely by the application of town sewage. The same remark

applies in degree to all the other instances quoted before the committee, such as those at Croydon, Malvern, Carlisle, Rugby, Coventry, Birmingham, Wimbledon, Tavistock, Colney Hatch, Haverstock Hill, King's Weston, Watford, Hayward's Heath, and Mansfield (the Duke of Portland's Clipstone Meadows), and other places. The tithe rent-charge being a fixed commuted charge, the profit thus resulting to the landlord will be considerable. I presume that the various land improvement companies will take parliamentary powers (if they have them not already) to undertake town sewage works on our great estates, on the same principle as for drainage, &c.

How will the Tenant's Interest be Affected by the Use of Town Sewage?

The evidence clearly proves that, by large applications of sewage, the crops of grasses (and consequently of milk, butter, cheese, meat and manure) may be increased from three to six fold and upwards, according to soil. Now, supposing that a tenant has a long lease of a suitable farm, it is quite clear that his present rent, chargeable against each ton of produce grown on the sewaged land, will be gradually diminished from 25 to 70 or 80 per cent. The same remark applies to tithe, rates, &c. But there is this enormous additional advantage, that having four times as much manure from the produce of the sewaged soil, he will be enabled to grow much heavier crops on the other parts of his farm unsewaged, and thus increase the profits over the whole of his farm. Of course the tenant must, under such circumstances, naturally expect that his landlord will, at the expiration of his lease, participate in the farmer's welfare, by a moderate increase in the rental. Among numerous advantages are the quicker return of the sewage system, as compared with solid manure, and the gain of having very early and very late feed.

What is the Probable Value of the Human Excrement of the United Kingdom?

There is no difficulty in answering the question, when applied to the feeding of animals; and the same principle holds good for human beings, because they eat the cattle which have consumed the cattle food. Science has revealed to us that, although our food passes from us altered in appearance, its elements are unchanged, and little is abstracted from it by full grown persons or animals. Taking the cost of consumable products (liquid and solid) used by the thirty millions of our population at £9 per head, or £270,000,000, and taking the excrementitious residue of such consumption at the very low estimate of one-tenth of the cost of the articles consumed, we should have as a result an excretal value of £27,000,000. Seeing that more than one-third of our population live in towns, and that the others who do not are very careless of their excreta, we may reasonably ask, is it not an act of folly, and of gross commercial error, to waste such a treasure, instead of availing ourselves of it to fertilize our soil, and cheapen and increase our food? We paid to foreigners £76,000,000, in the year 1861, for the consumable products they sent us. Ought not the excretal result of such an enormous importation to have greatly fertilized our soil?

To the estimate I have made must be added the excreta of animals which is deposited in our streets. In London alone the horses consume 30,000 quarters of oats per week, and hay in proportion. Here is Mr. Lawes' table, which is confirmed by the research of eminent chemists:

Table showing the estimated value of the manure obtained from the consumption of one ton of different articles of food; each supposed to be of good quality of its kind:

Description of food.	Estimated money value of manure from one ton of each kind of food. £ s. d.	I annex the average market price of the articles. £ s. d.
1. Decorticated cotton-seed cake	6 10 0	9 0 0
2. Rape cake	4 18 0	6 0 0
3. Linseed cake	4 12 0	10 10 0
4. Malt dust	4 5 0	5 5 0
5. Lentils	3 17 0	8 0 0
6. Linseed	3 13 0	.....
7. Tares	3 13 6	15 0 0
8. Beans	3 13 6	8 0 0
9. Peas	3 2 6	9 0 0
10. Locust beans	1 2 6	7 0 0
11. Oats	1 14 6	7 0 0
12. Wheat	1 13 0	14 0 0
13. Indian corn	1 11 6	7 0 0
14. Malt	1 11 6	.....
15. Barley	1 9 6	8 0 0
16. Clover hay	2 5 0	5 10 0
17. Meadow hay	1 10 0	4 10 0
18. Oat straw	0 13 6	1 10 0
19. Wheat straw	0 12 6	1 15 0
20. Barley straw	0 10 6	1 10 0
21. Potatoes	0 7 0	5 0 0
22. Mangels	0 5 0	0 15 0
23. Swedish turnips	0 4 3	0 15 0
24. Common turnips	0 4 0	.....
25. Carrots	0 4 0	1 5 0

How Other Nations Value Human Excrements.

The evidence of Mr. White, M. P. for Brighton, and formerly an alderman of London, is especially interesting. That gentleman has resided many years in China. The Chinese are evidently beforehand with us in the art of producing food. They don't throw away human dung as we do, and then go many thousand miles to buy birds' dung, at a high price, to replace it.

"James White, Esq. (a member of the House) examined—2353. Chairman: Can you give the committee any information as regards the use of sewage in China?—It happens that almost the whole manuring in China is effected by the application of the sewage—in fact, by much-diluted liquid manure; the Chinese have the idea that manure, whether the production of bipeds or quadrupeds, if applied to land in a dry state, burns the plant; they also say that you do not require to manure, or, as they put it, to fatten the land, but what you want is to feed the plant; and therefore they do not manure the land previous to sowing, but manure the growing plant. To us it is a matter of suprise when we land in China, to find that house dung is of no value unless it is contigneus to pasture, of which there is very little in China, the cattle being mostly stall-fed; they will not use

horse dung in arable land, because they say that the vitality of the seed of the weeds is not destroyed in the stomach of the horse, and that if they were to put horse dung upon their arable land, they would be filling their grounds with weeds, and therefore they will not use it. With reference to cow dung, it is applied for dyeing, and for other uses in the arts; indeed they think they would lose more than they would gain by applying cow dung or any other animal manure to land. For the same reason then, the question comes, how is it that the inexhaustible fertility of China is maintained at its present pitch? It is by appreciating what we waste in Great Britain. The custom in China is, daily to take from the houses all excrementitious, with any other animal and vegetable refuse, for manurial purposes. But to show the value attached to sewage, I may mention that it is the perquisite of the hall-porter in towns, and he is paid by the persons who bring the market produce in the morning. When this sewage is taken into the country, it is deposited in a tank or shallow well, which is ordinarily found at the corner of almost every field. Although the Chinese are not in some cases a cleanly people, they certainly are rigidly so with regard to this particular article; for in the villages, and among the poorer classes generally, it is the especial duty of a good housewife to collect all that has been produced during the day; wooden tubs with covers are uniformly used as commodes; not content with emptying and washing these tubs, she scrubs them with a broom made for this purpose, rinses them clean, and sets them out to dry in the open air; so that in the villages you pass through, you find rows of these red lacquered wooden tubs drying in the streets before their owners' doors. The way in which they put this sewage upon the land is, that they take a small quantity, a scoopful, and put it into a bucket of water; and in this very diluted state the cultivator throws it over his crop, or applies it to the root of each plant. The time chosen is always when the sun is setting; and any one who was walking through the country at the time, if the Chinese would only put a cover upon these particular receptacles, would be exempt from a great nuisance; but with regard to the irrigation, or rather the dispersion of the fluid over the land, that is not perceptible within a few minutes after its application. Nearly the whole cultivation of China is by the application of sewage manure, and that in a liquid state. In the south of China they collect it in a state of poudrette; you see people going about, like the chiffoniers in Paris, who are too happy when they find a prize to put it into their basket and spread it out to dry, in the vicinity of the neighboring temples, in the churchyards as we should say; thus reduced into a state of poudrette, it is a large article of commerce; there are thousands and thousands of tons shipped, more particularly to the sugar-growing districts, where it application is in a liquid state, because they apply it thus to the growing sugar-cane. Whatever may be the latitude and longitude (and any one who knows China knows what an immense range there is) the practice is the same, in the coldest as in the hottest part of China, which is the application of human excreta for the purpose of manure, and its application at different seasons, and always in a liquid state. In all their towns they have drains, what we should call sewers; they are generally formed of slabs of granite; in very inconsiderable towns they have them; but these sewers or drains merely take off the

surface water; they never allow any of the sewage to go into those drains. The proportions, when the excreta is diluted, would be about twelve to one. The population, I suppose, may be estimated at about 350,000,000 or 360,000,000 of souls. They never plow deep; they seem to appropriate all the manure to the plant. The agriculturists throughout the country use it for wheat, barley, beans, cotton, clover and all other crops."

Sir Joseph Paxton says: "In Flanders, that is, the garden of the Low Countries, at this time they are taking the better kind of sewage in small iron tanks by railway, and they take it down the railway a very considerable distance. The tanks are brought to the station, they are filled, and are so fastened that no impurity can escape from them. They are brought to the railway trucks, and there are about six or more of these tanks put upon a truck being lifted by a crane, and they are taken down thirty or forty miles, or any distance, in some cases shorter than that, and considerably shorter, and they are fetched away by the farmers. The tank is lifted off the truck and put into a little cart which the farmer has, and he takes it away, and he dilutes the sewage with water, in order to supply his plants, and he gives it out to them according to their requirements. They have a large number also of little iron boats, and these are filled with this sewage, and they are taken down, and taken up the canals in the different distrcts, and there it is sold to the farmers from these iron boats; they are now doing this to a very considerable extent in Ghent, and in various places in Belgium. The irrigation in Valencia is the most perfect irrigation which I have yet seen in existence; there they irrigate a valley fifty miles long, and which varies in width from eight to two miles, and there is not a vestige of this valley which is not irrigated, although the ground about the valley is not low, but is varied very much; it was done by the Moors, and the levels have been most perfect; the water is let on to each individual at certain seasons, paying so much money for it, and they have an enormous growth there; it is the most fertile, and the most garden-like piece of valley I should almost think in the world; it is certainly the finest that I have seen, and I have seen almost every highly cultivated district. At Barcelona they apply irrigation to the growth of oranges. The oranges which you get here, are grown by irrigation, water being applied to them at certain seasons. The irrigation of all Lombardy is carried on with very great success, and there I have seen wagons drawn by four oxen taking sewage manure from Milan, twelve and fourteen miles, in barrels." In his very valuable evidence he says, "Sewage is deodorized directly it is placed upon the land. I will give you an illustration of how this is effected. At the Crystal Palace at Sydenham, we had last year some 1,500,000 visitors, and of course there is a very considerable amount of sewage in that place, and rather of the best sort. In the front of those transepts at Sydenham, I have made large tanks, for the purpose of receiving and using this sewage. When I first proposed it, all the people went mad about it; the directors said, 'How could you think of putting all those sewage tanks just in front of these transepts where everybody will be coming out; it will be sure to send everybody out of the garden.' I said, 'It will do nothing of the sort; I understand what I am about, and you will never have the least smell from it.' Of course I took the trouble to explain the way in

which I should do it; that I should cover the tanks over, and put a small pipe to keep the tank ventilated; it is turned up a column of the building, and goes up to the top; that is a complete ventilation, and I will defy anybody to have ever found the least smell from that sewage. Then we have a pipe which leads from the tank; and these beautiful scarlet geraniums which you see in flower there are very often watered at four o'clock in the morning, with very strong solutions of this sewage. But, of course, we have five times as much as we want, and it is a nuisance, because we do not know how to apply it. If we had a very large tract of land we could make a corresponding amount of growth. In fact, we are obliged to let a large quantity of the sewage drain away to the Croydon districts, which is a great loss to us, and a nuisance to them. We clean out the solid matter from these cesspools once in two years."

The Croydon Sewaged Meadows.

Mr. Fenton gave valuable evidence on these before the committee (1982). Since then, Mr. Marriage, of Chelmsford, a practical farmer, who rents them, has favored me with the following dependable facts: He pays £1,500 annually for the 300 acres. The former rental, before the sewage was applied, was under £2. The cost of leveling, making the carriers, &c., is about £5 per acre, £3 of which was allowed by the town of Croydon. The ground is very level, with a gentle slope; and thus the expense of laying out has been small. The inhabitants of Croydon are about 28,000; but he only gets the sewage from 18,000, or about sixty persons to the acre. This, he thinks, is an ample supply; and he knows, from experiments tried, that, although the water passes from his land quite clear, it still contains a great deal of fertilizing matter. He only gets the fluid excrements, the solid being arrested by filter-beds. He would prefer having the whole. The sewage is mixed with a daily supply of water equal to one million gallons, to which must be added the rainfall and drainage from springs that ooze into the pipes, and increase the quantity to two million gallons. The sewage goes on winter and summer. The first cut of grass was last year, the 10th of April, and it was continued up to the 7th of November, being nearly all sold to cowkeepers, &c., who are now beginning to appreciate the advantage of using it. He continued to cut it for his own cows until the 27th of November. Although the meadows are newly sewaged, he reckons the produce at thirty-two tons per acre; this, if dried, would represent about nine tons of hay. He differs with Mr. Lawes as to the grass not having fattening properties. Some bullocks which he turned out gained flesh twice as fast as they would have done in Essex pastures. He fed forty of his own cows, from May to the end of November, with the refuse grass only, which he did not send to market. They were in full milk, and gained considerably in condition, although they had nothing but the grass, and, being stall-fed, lay on the bare bricks, he having no straw for them. He is, with me, of opinion that a ton of this grass is worth much more than a ton of mangel (for which the cow-keepers pay £1,) as it contains twice as much dry matter. Mangel wurzel alone would destroy cows by purgation; while the sewaged grass alone gives milk and condition. Mr. Marriage thinks the meadows will improve annually for some time, as this

is only their third year of sewaging. Mr. Fenton, engineer to the Croydon Board of Health, says: "The land is let to Mr. Marriage for eight years at £5 per acre. We allowed him £8 per acre for leveling the land and forming the irrigation channels. I anticipate that the land will be worth much more after the end of this term of eight years. The land adjoining, not sewaged, lets for about two guineas per acre, which was the rental of this land before it was sewaged. We take the solid matter out of the sewage. Last year I think we sold 1,200 loads at only 1s. per ton; it was a very low price. They now pay 1s. 6d. When the sewage comes out of the filter, it is merely dirty water in fact. The average sewage per day would be one million of gallons—increased to near two millions occasionally by rain and springs brought by the filtration from the surrounding country into our sewers. Our tenant has to pay one-half of any expense that we incur at the filter works—about 10s. a day for carbonate of lime—in addition to the rent."

The Coventry Sewage.

Francis Wyley, Esq., late mayor, says (4491): "I cut grass yesterday (12th of May) at the rate of more than seventeen tons per acre; that was in two months and twenty days' growing. A cow-keeper ate off every blade of grass to 31st January. I had the sewage put on the 1st February. We pass the sewage through filter beds before we put it on the land. The grass is quite laid; it is quite bleached at the root, from being so thick. Where I put the sewage, the cattle prefer it to that in the same meadow which I manured with solid manure."

Edinburgh.

Samuel Christie Miller, Esq., late M. P., said: "I am proprietor of the Craigentinny meadows, near Edinburgh—200 acres irrigated by gravitation, and fifty acres by pump application. It is irrigated by main carriers and open gutters. It is laid out purposely for the best application of sewage; also convenient for the purchasers of the grass. The sewage flows constantly night and day, except in winter nights, when it flows to the sea. As there are water-courses mixed with the sewage, it is necessary to be careful, to avoid flooding at particular times. About forty acres are sand; forty acres a very strong clay; some is a very fine soil; but there is every variety. The sewage is good for all the soils; but the sandy soil absorbs and filters most, sending it clear to the ditches. Cutting begins between the last day of March and the first day of May. The sewage is applied immediately after each cutting. The crops are let by auction every year, from 1st of April to 10th of October. The sewage is applied twelve times a year. The average letting is £22 per imperial acre for the six and one-half months. Some portion of this irrigation is very ancient—about two hundred years old. The produce is used by cow-keepers, who come from Edinburgh, and as far as six miles." Mr. Miller lives on the estate some part of the year, within one hundred yards of some parts of the sewaged meadows, but finds no nuisance, owing to its great dilution. The barracks are close to the meadows, and are particularly healthy. Mr. Miller pays nothing to the town for the sewage. Six men are employed at an annual

cost of about £1 per acre, with addition of repairs to sluices, and horse labor. Mr. Miller speaks disparagingly of the fifty acres on which the sewage is pumped up; it produces, however, £15 per acre. "Thinks that some of the main drains might smell when the water is let off there on a Saturday night; but the sewage, when running over the land, does not smell—it is so much diluted. Thinks the hose and jet principle would pay on poor soils rented at 20s. to 30s. per acre. Conducted Prince Napoleon over the meadows while in course of irrigation two years ago."

The Greatest Produce is Received in Hot Weather.

He says: "It is marvelous to see the grass in hot weather, when it has been cut in the morning, and the roots are quite white from a heavy crop; they will be green in two days. The best possible application of the sewage is immediately after the grass is cut. The tenants never complain of having too much sewage, but the reverse." Speaking of the sewage, he says: "It is a marvelous application of manure, and not only in this but in various other cases; and we shall all come to it more or less in the course of time and when better understood, I am quite satisfied. The slope of the land is one in 100. The crops vary with the seasons, independent of the sewage; hot, dry summers, are most advantageous. The rent, however, is fully maintained. The sandy land produces more than the clay land, but less than the rich friable land." Speaking of the Duke of Portland's meadows, he says: "The late Duke of Portland had a very important irrigation, which was undertaken by him at very great expense, after he had seen the irrigation at Craigentinny. 3204. That is only by means of a river, not by sewage, is it? Yes, it is; the late Duke of Portland took the whole of the sewage of the town of Mansfield into a stream, and he carried it down to his Clipstone Park meadows. 3205. It came down by the river, did it not? Yes, in the same way as ours does; ours is a river at times, and has water running into it from brooks and streams; it is a natural watercourse; it is precisely the same as the Duke of Portland's. Now the Duke of Portland expressed to me himself repeatedly, and in writing, that there was no application of manure equal to the application in a liquid state, and he has abundantly proved the fact in his Clipstone Park meadows; he applied it there to cabbages and to grass. But it has occurred to me that upon arable land the same system might be applied which is applied in the districts where the land is warped by the streams, namely, that you might with these open feeders have a catchwater, so as to apply the water in the winter, and allow a deposit." Mr. Hope, a neighboring farmer, speaking of Mr. Miller's meadows, says: (3313.) "The sandy land next the sea is worth, in its natural state, 5s. an acre. I suppose it would now let at £30 per acre to a cow-keeper. When the sewage passes from the sandy land to the sea, it is quite poor; you could not tell that it had been dirty water at all. Cow-keepers prefer the sewaged grass to the ordinary young unirrigated grass. Does not think the sewaged grasses so good for horses, being soft and succulent. If a great extent of land were sewaged, the market for cow-keepers' use would be overdone. A vast quantity of the Edinburgh sewage runs wastefully to the sea. Any quantity of sewage will tell upon grass; a small quantity

would tell; but of course the larger the quantity the more it would tell. I do not think you can put too much of it on, if the soil will take it." Mr. John C. Morton, (3548), the Lochend meadows, Edinburgh: "Ten acres are laid down with Italian rye grass, and irrigated by pumps, pipes, hose, and jet. It receives from 600 to 800 tons at each cutting. It realizes from £21 to £27 10s. per acre. It is laid down for two years, and then a crop of potatoes taken. The potatoes are not manured with sewage. The soil is an exceedingly light one, and therefore 'carrier' irrigation would not answer. Edinburgh grass was a fortnight earlier than the Croydon grass, owing to the extra quantity of sewage applied to it, although Edinburgh was seven degrees further north."

Birmingham.

Mr. J. W. Till, borough surveyor, says: (1305) "The sewage of Birmingham in dry weather is about 12,000,000 gallons daily. The water closet system is only very partially adopted. The greater proportion is still retained in cesspools or ash-pits. About sixty tons daily of solid matter is intercepted from the sewage, and given away to farmers after partial drying, and they cart it from eight to ten miles. Thinks it will some day realize 1s. 6d. to 2s. per load. The liquid sewage which flows on to the adjoining land (about sixty acres) gives most enormous crops of grass. He (the farmer) will graze it very late, and have a crop of hay before any of the farmers in the immediate district have had a crop. Believes the liquid is very much more valuable than the solid. It is given free of expense on the sixty acres, on account of the facilities the farmer offered in the construction of the works. It is proposed to extend the irrigation over other lands on the banks of the river. It costs the town of Birmingham £6,000 per annum to get rid of the cesspool sewage, night soil and excrementitious matter. Farmers in the neighborhood are anxious to have the sewage on their lands, having seen its effects on Mr. Burbidge's land. Objects to giving the monopoly of the sewage to any particular farmer. The corporation require additional powers to deal properly with the sewage." Mr. R. Fowler, junior, (1443) expended £9 10s. per acre on thirty-six acres, to irrigate it with the water of the river into which this Birmingham sewage flows. The annual value of the land is increased 30s. per acre. Thinks that 3,000 acres might be irrigated below Birmingham. Mr. J. King, tenant farmer, (1621) has expended £15 per acre, on seventy to eighty acres, in underdraining, making water carriers, etc., to irrigate with the river water of the Tame, since the Birmingham sewage flowed into it. Finds a considerable increase in the bulk of his grass. This irrigation has as good an effect as irrigation with plain water on manured meadows.

Carlisle.

Mr. McDougall irrigates thirty acres of grass land with a portion of the sewage of Carlisle, which is very poor. It is pumped up eleven feet, and then flows by gravitation. The operation is successful. It is deodorized by carbolic acid, which is supposed to diminish somewhat the action of the sewage. Mr. John C. Morton says he thinks that they put on 4,000 tons per acre.

Chatham.

Mr. T. Compost (4156) takes the night soil from Chatham. The night-man spreads it; he takes two buckets, sets out his piece of ground, and spreads it with his drift. Puts it on as it is for a crop of potatoes. He says: "I have used guano. I do not think it equal to night soil. I would rather have sixteen yards of night soil than half a ton of guano. I have a very slight opinion of guano."

Mr. Westwood, late bailiff to the North Surrey District pauper school, at Anerley, near the Crystal Palace, (number of inmates 700) says: (4377.) "The land is a stiff tile clay, and used to let at 15s. per acre. It was a bare clay, without top soil. It has since been drained, but I do not know the cost. It is now worth £4 to £5 per acre. It was sewaged in 1851. Twelve acres of meadow and two acres of Italian rye grass are flooded with sewage by gravitation. Two acres are sewaged by force pump worked by the boys. The sewage flows from the tanks over the land. We have more sewage than the land can filtrate, so it flows away wastefully, and we have been obliged to deodorize it to prevent its becoming a public nuisance. The general effect on the rest of the farm of this application of the sewage to the grass land only, was, that we produced so much more farm yard manure from the stock we kept that the productiveness of the rest of the land was greatly increased. We were able to grow five or six quarters of wheat per acre on land which had not previously averaged more than two and a half quarters." Mr. Tregellen, a farmer of 200 acres, says: (266,) He applies 350 tons per acre per annum, of sewage rather stronger than town sewage. He produces double the quantity of grass by the use of sewage. He says: "It keeps the land warm in winter, for I find that during the time the water is flowing over the ground the grass continues to grow, and I have always green grass in winter, while the other parts are dead or dying."

Rugby Sewage.

Mr. J. C. Morton, (3616.) "I saw at Mr. Campbell's, at Rugby, a magnificent crop of Italian rye grass in its second year, which was much the finest thing of the kind that I have seen this spring (evidence given 15th May, 1862). It probably weighed nine tons to the acre. It had during the previous four weeks maintained forty-five cows, so that it must have averaged nine tons to the acre, that being a single cutting of Italian rye grass. It did not wholly maintain them, but I suppose that they received during that time three-quarters of a cwt. a day, a-piece, besides oil cake and other food. Sewage was thrown into the surface irrigation by pipes, and pumped through those pipes by a sixteen horse power engine." Mr. Lawes says: (428.) "Laying out grass land for my own purpose, I should allow 9,000 tons of sewage per acre." This is ninety inches of fluid, equal to three and a half years' rainfall. He says: (441.) "The largest produce I ever obtained in these experiments with an enormous quantity of dry manure, was about twelve tons of green produce per acre; with sewage the produce was thirty-two tons per acre." (443.) "£12 is a large rent for a very good water irrigated meadow; if you put on sewage you would probably get £30 up to £40 per acre." (444.) "I could get £30 to £40 rent

per acre for the fifteen acres at Rugby, if I put on sewage enough, but if only water irrigated, £6 to £7 per acre; that is, if the sewaged meadows had received 20,000 tons of sewage per acre. I suspect that amount is put upon some of the Edinburgh land." (478.) "The unsewaged acre (good land) kept a cow twenty weeks; the next acre, receiving 1,500 tons of sewage, kept a cow forty weeks; the next acre, 3,000 tons, kept a cow fifty-eight weeks; the next acre, which received 4,600 tons, kept a cow sixty-eight weeks." (483.) "The milk was valued at 8d. per gallon, and produced:

Unsewaged acre	£11	3	0
1,500 tons sewage acre	18	14	0
3,000 tons sewage acre	26	18	0
4,600 tons sewage acre	31	11	0"

The value of the manure would of course be in the same proportion. The food was all cut green and carried to the cows. It was found that the same grass given to fattening bullocks, rather decreased than increased their weight. It kept them, I suppose, constantly purged, as with fresh mangel wurzel. A very different result would have taken place had the crop been Italian rye grass, or had they received a preparation of dry food. These careful experiments established beyond a doubt that the quantity of grass increases as the quantity of sewage is increased, and that the application of sewage produces much earlier and much later feed. Comprehensive details of these valuable experiments are recorded in the first and second report, "Sewage of Towns, Government Commission of Inquiry, 1862.". Mr. Lawes considers that the sewage of Rugby might be conveyed to the land at about one farthing per ton. The commission paid about one penny per ton for the sewage with which they experimented. The rent of land was £5 per acre. The experiments were conducted for two years, and over an area of fifteen acres. The sewage was all measured, the grass weighed, and strict tabular accounts kept of every detail, the manure analyzed, etc. The five acre sewaged field produced thirty-three tons per acre of ordinary grass. The ten acre sewaged field produced twenty-seven tons. With an enormous quantity of ordinary or dry manure no more than twelve tons could be obtained, so that we must give up all hope of obtaining great increase of milk, cheese and butter without the aid of irrigation by sewage; nor can we produce on the dry system, for the fertilization of other crops, more than one-third as much manure as by the sewage system. Both Mr. Lawes and Mr. J. C Morton have in my opinion very considerably underestimated the value of town sewage. Putting it at one farthing and one half-penny to three farthings per ton, let us test the value by the foregoing government experiments:

One sewage acre gave in milk	£31	11	0
Minus rent, £5, and rates, tithes, etc., £1	6	0	0
Profits to pay for sewage	£25	11	0
One acre unsewaged produced	£11	3	0
Minus rent, rates and tithes	6	0	0
	£5	3	0

Leaving in fact a balance of £20 8s. in favor of the sewaged acre, and three times as much manure, which of itself would constitute a good profit.

At one penny per ton the 4,600 tons of sewage which were applied would amount to £19 3s. 4d. The actual net profit would be £1 4s. 8d., and all the manure arising from a consumption of some thirty-three tons of grass. But there is still a further profit in the improved condition of the soil for an ensuing crop, after such an extreme manurial dressing. Mr. Blackburn complains in his evidence that the experiments at Rugby were not conducted favorably to sewage, the land being laid in high backed ridges and deep furrows. I see also, by the report of the commission, that the irrigation was from accidental causes suspended during a valuable portion of the summer.

Malvern.

Mr. McCann, (3978,) of Malvern, Worcestershire, a farmer of 500 acres, applies the sewage of Malvern to a portion of his with very great advantage, and has used it for various crops successfully. He pays nothing to the town for sewage. It cost him £3 per acre to prepare the land to receive it. It flows by gravitation.

Watford.

The Earl of Essex (1) takes the Watford sewage (4,000 inhabitants). Has applied it with great advantage, barring engineering mistakes, to almost every crop. When his mangel failed he transplanted a field with them at the middle or end of June, and soaked it with fresh sewage; had the finest crop ever seen in that neighborhood, say forty-seven tons per acre. Applies 600 tons per acre to ordinary grass, and gets enormous crops. Puts 5,000 tons per acre, per annum, on Italian rye grass. Has ten acres of Italian and thirty-five acres of common grass under sewage. Uses a little on other crops. Erred by laying down pipes on 210 acres. It would pay well at a halfpenny or three farthings per ton. Uses 60,000 tons a year. His land increases in productive value by town sewage. It has a permanent influence on the soil. Six hundred tons per acre have destroyed fern, and a quantity of plantain and coarse weeds of that sort, which have been replaced by valuable grasses.

Professor Way's Evidence: Liquid Excreta is much more Valuable than Solid.

(899.) If anybody precipitated the sewage, and gave a perfectly clear liquid, I would be quite willing to take the liquid for a farm after he had got the solid matter out of it; nine-tenths or four-fifths of the value remain in the liquid. (921.) Generally speaking, is the virtue of sewage seen in the subsequent crop; how many years do you suppose that the virtue of sewage would take to exhaust itself?—It will be seen for very many years afterwards, if the land is such land as can absorb its properties. I am speaking not of the crop, but of the land; that is to say, if it is a nice open loam it will permeate every part of the soil, so as to impart to it the materials which make it valuable. (922.) We have had it in evidence that the virtue is exhausted in a year. In your opinion is that wrong?—It may be true, if it is able to produce a crop, and consequently the crop takes it, and in that case it is the most direct investment of the value of the sewage

which you can have; you put on manure in a dry state, and you do not know whether the plant then growing will have it; you put on sewage and get an increase of crop, which is the money return for the sewage. (923.) Viscount Holmesdale: Is there no process by which a dry manure can be formed with profit from sewage?—No. (931.) Chairman: Have you observed any difference in the heat of sewage as compared with common water?—Sewage is always warmer. (932.) Therefore it is in that respect beneficial in its application to land?—Yes. (933.) It imparts heat?—Yes. (934.) Colonel Fane: You stated that the increase of the value of land to which sewage was applied was from £30 to £40 an acre; is that your opinion, and how did you gather that opinion; are you a farmer, or have you facts to prove it?—I am not a farmer. (935.) What facts have you to prove it?—The facts upon which we shall, I believe, next week sign a report to Parliament. We are a commission, and as a commission have made certain experiments; those experiments prove that an increase of £30 or £40 per acre is obtainable from the application of sewage to grass land. It is perfectly true that I have not made those experiments myself; but they have been faithfully made, and they are such as I have no objection to adopt as my own.

Professor Hoffman (632) gave very valuable evidence as to the worth of London sewage. The result of several examinations and comparisons, taking guano as a standard, was 2d. per ton of 220 gallons, delivered on the land. This was a fair average value, taking rainfall, night sewage, &c., into account. I would recommend a careful perusal of the whole of his evidence. He says 100 tons of sewage contain suspended matter, 82.7 lbs., worth 2s. 2½d.; dissolved matter, 245.9 lbs., worth 15s. 4½d. Thus 100 tons of sewage have a value of 17s. 7d. This valuation is tested by guano at £11 per ton.

What Crops would Pay Best for Sewage.

On this point the evidence is most unanimous. Italian rye grass stands first, then ordinary pastures, clover, &c. Italian rye grass, I know, from long experience, is much to be preferred. It is a more greedy feeder, it grows more quickly, and will dispose of much more moisture than any other grass. It stands stiffer, like a corn crop, admits more air to the soil, will stand more forcing, and does not get laid and rotten like ordinary grasses. It possesses another most valuable property—it fattens rapidly, and no animal will ever scour upon it. We all know how immense are losses in health and condition by animals scouring; Italian rye grass prevents this. Nothing impoverishes soil more with ordinary farming and dry manure than Italian rye grass; but with sewage it has the contrary effect, and fertilizes the farm. After sewaged Italian rye grass I can take abundant pulse, and then cereal crops. One acre of highly sewaged Italian rye grass, cut and brought to the homestead, suffices to keep my eighty head of young and old bullock stock and my farm horses for a whole week (the stock have cotton cake, &c., in addition), and it is fit to cut again in summer in five or six weeks. It is easy to understand what a quantity of manure is thus produced in summer for other parts of the farm. Sir Joseph Paxton says: "I do not believe that you could grow any

food plant with sewage so well as the Italian rye grass; I believe that that is stimulated with the smallest amount of sewage. You could grow mustard and cress in forty-eight hours, perfect, if you try the experiment; that is a very quick development. If you take Italian rye grass, I believe that it is the very best possible grass which is at present known for the purpose of sewage irrigation." Mr. King (2227): "Do you think that sewage could be applied with advantage to corn and root crops?—Most certainly. I think that arable land might be entirely cultivated with sewage, without the assistance of other manure, by taking it in proper quantities and in proper crops—say for clover; clover would bear a large quantity. Then if you broke up clover for wheat, the wheat would not require any manure, because the sewage would be in the land from the clovers." I will relate the manner in which I treat my own Italian rye grass, which I find very satisfactory and profitable. It is sown with the barley or wheat crops. It is sewaged in the autumn or winter, and after each cutting receives sewage and 3 cwts. guano; the second year it is folded with 100 sheep to 6 acres, and keeps them from the end of March to October. Their increased value is about £100, or £16 6s. 6d. per acre. They were folded upon it piece by piece, having cotton cake. When the grass was long, it was mowed, and they ate it through the iron fold hurdles; when short, they helped themselves. They went over it about four times; at each clearing the ground was well soaked with sewage and 3 cwts. of guano. This is the system I should recommend, omitting, of course, the guano where you can have abundance of town sewage. A field so treated will afterwards carry a pea crop, two cereal crops, seed clover, and seed tares without exhaustion."

Mr. Blackburn, whose evidence is very valuable, speaking of the grasses at Rugby says: (1866), "I do not consider them at all fitted to yield an adequate return from large applications of sewage. I know, from my own experience on that point, a difference may be made in the variety of grass alone of 50 per cent. I think that attention to this would form an important item in the results." After praising Italian rye grass (1878), he says: "Timothy grass is one of the very best, also foxtail and Poa aquatica." He recommends a level surface, and says "that the ridge and furrow system at Rugby is most objectionable, as at the top of the ridge there was a very bare amount of grass; in the furrows it was very luxuriant, and would be rotten before that on the ridge was fit to cut." He also says: "I have tried guano as against liquid farm manure; the result being very greatly in favor of liquified farm manure. I found that half the quantity of concentrated manure washed in with water would yield a better return upon grass land than double the quantity applied and left to the mercy of the elements." He says: "There is much less nuisance from the application of sewage than from the use of solid farm manure. I have very frequently been to Lord Essex's ground during the application of the Watford town sewage, when there has been little or no offensiveness even during the process of distribution."

The Question of Dilution.

Objectors to the use of town sewage urge that it loses its power by dilution. This objection will not stand the test of examination. It is admitted that 1,270 tons of sewage contain the manurial elements of one ton of best Peruvian guano. Now, every ton of guano spread over our fields receives from Nature a much greater dilution by rainfall than the much abused sewage; and, in fact, without rainfall to intermix it with the soil, it would be valueless. 1,270 tons of sewage per acre are equal to a rainfall of 12½ inches. As our average annual rainfall is 26 inches, or 2,600 tons per acre, and as a ton of guano is usually spread over 10 acres, it follows that it is actually diluted by and mixed with 26,000 tons of water, while its equivalent in sewage is only mixed with 1,270 tons, to be added in fact to the natural rainfall of 26,000 tons. Our soil has the power of abstracting from water the manure contained in it, and the mere drainage of our lands has caused our rivers to be more pure by preventing the washing away of the farmer's manure and fine top-soil. Grass lands in our eastern and southern counties will during summers derive great advantage from town sewage. Sir Joseph Paxton, in his evidence, values water alone at 2d. per ton at certain growing seasons. We know that pastoral districts are eminently those which receive the greatest dilution by a large rainfall. The part that water alone takes in preparing the soil itself for the use of plants is far too important to be overlooked in the sewage question, and is fully explained by Liebig and other scientific men. It is heat combined with ample moisture that gives the enormous vegetable growth described by Sir Joseph Paxton in his evidence (2427): "I tried some experiments upon a bamboo cane some years ago, in order to see the most extensive growth that could be got upon a plant in a given period of time. This plant was kept excessively moist at the top, and moist at the bottom; there was a thorough drainage; it was in a high state of condition to try the experiment upon, and this plant, for twenty days, grew at the rate of 10 inches per day, which shows an enormous growth to have taken place in that time. In proportion, you may go on with experiments upon other plants, but you should always take, I think, for the purpose of sewage, those plants which will develop themselves with the lowest amount of temperature, in order that you may, by the application of sewage, get the greatest number of months in the year in which the plant can be developed." If ever there was a doubt about the great superiority of town sewage over every other manure for pastures and artificial grasses, clovers, &c., that question has been settled forever by the facts produced in evidence. Mr. J. B. Lawes says: "I know from experience in using dry manure, each addition, after a certain amount applied, does not increase the produce in proportion; with double or treble the amount of ammonia you do not double or treble your produce. (518.) There is no proof in these (sewage) experiments that we have exceeded the profitable limits. We have gone up to 7,000 tons a year, and the produce is pretty nearly in proportion to the quantity of sewage used. (441.) The largest produce I ever obtained in these experiments, with an enormous quantity of dry manure, was about 12 tons of green produce. The

quantity obtained by sewage irrigation was 33 tons of green produce per acre. (443.) £12 is a large rent for a very good irrigated meadow. If you put on sewage enough you would probably get £30 or £40 a year." In plain English, Mr. Lawes' evidence shows that, while an enormous application of dry or ordinary manure can only produce £12 per acre in grasses and green crops, the same or a less quantity of such manure diluted with several thousand tons of water would produce £36 per acre, or an increase of 200 per cent! What a lesson these facts teach the British farmer in the use of his farm manure on grass lands where water is accessible! What becomes of the objections to dilution for grass crops?

There are Many Discrepant Opinions About the Quantity of Sewage to be Applied per Acre.

When farmers pay so much per ton for it, they will exercise their own discretion, and I have no doubt will soon find out what quantity suits best, and to which crops it will prove most suitable. Speaking generally, Italian rye grass and pasture will stand much forcing; cereal crops would only require small quantities. The advocates of enormous quantities per acre, say 8,000 to 20,000 tons (three to eight years' rainfall), would commit a real injustice to the country at large. The feeding of the population of London exhausts 6,000,000 of acres annually; it would be a great inconsistency to put its manurial residuents on 20,000 or 30,000 acres. You might as well propose to a farmer to manure one acre with the produce of 200. Enormous crops of green food from sewaged land can only be used as food for animals. You cannot mako hay of it: it is too thick upon the ground, the land is too wet, and the after-growth too rapid. Much of the sewage, although as clear as spring water, might be used advantageously a second time by gravitation.

Sewage Mistakes.

We pioneers, in sewaging our farms, have all erred in piping too much land. Experience has taught that it is most profitable to confine the application of sewage to a limited area of pasture, and especially Italian rye-grass. These will take a very large quantity of sewage, and by getting the produce of four acres on one acre, it affords ample supplies of manure for other parts of the farm. Pumps and pipes have also been too small, and steam engines of insufficient power, although my own will put on 100 gallons per minute. I should prefer to put on 300 gallons per minute if I had an abundant supply of sewage from a town. The facts educed by the parliamentary committee will go far to correct and prevent such errors in future. On arable farms possibly 15 to 20 per cent. of the farm would be enough under sewage. As our produce of cattle food will be multiplied three to four times, our cattle and capital must represent a similar increase in relation to the sewaged area. I have walked several times through the wonderful and gigantic tunnels of the Metropolitan Board of Works. These tunnels or sewers, nine feet in diameter, on the north side of the Thames, run for many miles side by side on great embankments of solid concrete, much above the level of the surrounding marshes, which almost invite their contents. On the south side they are often 80 feet below the surface.

These rivers of sewage will be conveyed to covered tanks 35 acres in extent, (15 acres at Barking, and 20 acres at Plumstead;) and, if agriculture so decides, from these it may be at once pumped and distributed many miles away from London, otherwise it will flow daily into the Thames at ebb tide, to poison the river. These great works, which will cost near four millions of money, quite eclipse the celebrated *Cloaca Maxima* of the ancient Romans, and will astonish the New Zealander, who will, 2,000 years hence, according to Macaulay, view the ruins of our great metropolis from a broken arch of London bridge. I partook of a champagne luncheon 80 feet under Woolwich, in a gigantic sewer, several miles long.

Are we, as Agriculturists, prepared to take this Sewage?

The witnesses generally say that we are not. Sir Joseph Paxton (2444:) Have you tried to induce the farmers around to take it?—The farmers around are a long way behind the times; the truth is, that farmers are a hundred years behind horticulturists, and the application of this sewage question, in the extended form in which it has been suggested, will be the greatest difficulty when you come to these gentlemen, the farmers; they will have their own way, and they have a right to do so. Mr. John C. Morton, (8670) [Mr. Whitbread:] The value of sewage manure as a fertilizer being admitted, what, in your opinion, have been the chief causes which have operated to prevent the application of it more largely than has hitherto been the case?—I suppose that it has been occasioned by *vis inertiæ*, men not being wide awake. Lord Essex (47:) Have the farmers in the neighborhood tried this sewage at all?—They have no means of doing it; I have got it all. They have seen the result at my farm, and they say that it is all very fine, and so on. My own opinion is, that when they see the practical results, and find that *it pays*, they will soon adopt it.

Value of Sewage Tested per Head of Population.

The evidence agrees that an average of sixty people, giving, with rainfall and water supply, about 4,000 tons of sewage per annum, will produce an enormous increase per acre of pasture grass or Italian rye grass. If you were to ask a farmer whether sixty well fed sheep and lambs, kept a whole year upon one acre of ground, would manure that amply, he would be astonished at your proposition; seeing that two to two and a half sheep per acre is above the average manurial supply of the United Kingdom. Now comes the question, what is the worth of the annual excreta of each human being in this metropolis? Mr. Lawes puts it at two shillings per head, but as every individual consumes in food and drinkables about £9 per annum, this valuation neither accords with his own table nor with the recognized valuation of farmers themselves.

2s.	per head	would	give	3-8ths of a penny	per ton of sewage.
4s.	"	"		6-8ths do	do
6s.	"	"		1 1-4 do	do
8s.	"	"		1 1-2 do	do
10s.	"	"		1 7-8 do	do

The latter is, in my opinion, nearer the value than Mr. Lawes' estimate, if delivered on the farm, but comparison and competition will soon fix a proper value. I consider Mr. Morton's estimate of a halfpenny per ton

much below its value. Lord Essex gets the Watford sewage (60,000 tons) at, I believe, 3d. per head, or one-fifth of a penny per ton. I think at Rugby less than that is given; and from some towns, especially Edinburgh and Birmingham, no charge is made for the sewage. Farmers would be very glad to get sheep fed on their land on such terms, and weight for weight a human being produces better manure than a sheep. Of course, the price paid to the town or corporation, and the cost when delivered on the farm, must vary very much, according to distance and expense of conveyance; but when absolutely placed on the field, good town sewage cannot, in my opinion, be worth less than one and a half pence to two pence per ton. In valuing per head of inhabitants, we must take care to estimate those only who use water-closets, and whose excreta goes into the sewers At present, especially in country towns, water-closets are by no means the rule. As a farmer would tap the sewage at seasons most profitable to himself, it would then have its greatest value, say during the summer or growing months. We must remember that in addition to human excreta, our sewers will receive the boilings of our animal and vegetable food, washings from slaughter houses, an immense quantity of soap washings, the washings of the horses' water-closet, (the street pavement,) and there are many other valuable substances that enter the sewers. It will be well mixed in the great tanks at Barking and Plumstead. The great fifteen-acre tank in which the daily sewage will be received, will give fair play to the consumer. Here the coveted morning sewage will mix with the poor night sewage. The excreta from the poorly fed pauper and turtle-fed alderman will here enter into equitable combination for the good of agriculture. The poor and rich districts will be thus equalized. In conclusion, let me entreat the people of England not to neglect the truthful and ominous warning of Baron Liebig in his letter to me: "I know that the prophets of future evil have at all times been derided by their own generation; but if history and natural laws can furnish any ground for a just conclusion, then there is none which stands more firmly than this, that if the British people do not take pains to secure the natural conditions of the permanent fertility of their land, if they allow these conditions, as hitherto, to be squandered, their fields and meadows will at no distant time cease to yield their returns of corn and meat. But it does not belong to the province of natural science to discuss the question whether the might, strength, and independence of the nation will be preserved, after this state of things shall have gradually arisen."

Mr. Edmunds said he would be glad if, besides hearing a few words from himself, the meeting would listen to some remarks from his friend Mr. Campbell, who had had considerable experience in sewage irrigation. (Hear, hear.) He thought the whole country was very much indebted to Alderman Mechi for having continually agitated this subject. They all knew that nothing, scarcely, that was important had ever yet been carried out without enthusiasts. Whether it were religion or anything else, there must always be an enthusiast to keep the ball rolling; and he was very glad that they had got such an enthusiast in the worthy alderman. (Laughter.) At the same time he must express his belief that the way to make sewage really valuable had not yet been discovered, although the subject was

being constantly brought before the public; and if any man of capital were so foolish as to imagine that money was to be made, even out of the London sewage, with all that was now known about it, he had better emigrate at once, before he lost his money. (Laughter.) There were one or two things which he was anxious to mention, because they were within his own knowledge. On examining the land at Rugby, which had been irrigated with sewage, he found that all the valuable grasses had disappeared. He could not find one bit of red or white clover; all that was to be seen in the irrigated meadows was very soft grass. The other day he went with Mr. Campbell to look at a rick of hay, with the view of buying it. It was obtained from irrigated land the year before, and it was so soft and had so little smell that he declined to purchase it even at forty shillings a ton. He was convinced that if the system of irrigation were applied indiscriminately throughout the country the result would be very unsatisfactory. (Hear, hear.) The worthy alderman had quoted a great deal of evidence about what had been done by means of irrigation in the vicinity of Edinburgh, but that case was a peculiar one, the soil being so exceedingly porous, it acts like an enormous filter. What was recommended for general adoption amounted to the old story of the grain of gold in a bucket of sand. There was indeed value, but the value was not sufficient to remunerate. If they took the sewage of a town, they must take it at all times, in winter as well as in summer, and hence it had been found a nuisance in almost every place where it had been tried. It made the land a complete bog. If the soil were very porous and sandy, the sewage did not hurt it; but if it were otherwise it was almost ruined. He felt an interest in this subject, because all towns which had adopted the expensive system of water-closets wanted in some way or other to get rid of their sewage, and at present they did not know what to do with it. They knew that they were losing a very valuable manure, but they knew also that that manure was in a form in which it was not usable. It might indeed have been a very great mistake to adopt the water-closet system at all; but in towns where it had been adopted it was sure to be continued. He did not mean to say for one moment that there was no value in sewage manure; there was value in it; but as much science and care were required in the application of sewage as in any other part of farming. (Hear, hear.) At the same time, he considered that they were all very much indebted to those who experimented in the matter. Alderman Mechi's declaration, that he thought it would have been better if he had put the sewage which he used over a quarter of the land, showed in what a diluted state the sewage was, and what an enormous quantity was wanted to produce good results.

Mr. Campbell (Rugby) said he was very glad to have an opportunity of addressing a meeting like that. Theory was a very good thing, and science was a very good thing, but practice was superior to both. Neither science nor theory was of any use unless practice went along with it, and he felt satisfied that the gentlemen assembled were practical men. He had been distributing sewage manure for the last eight years, and therefore he expected that what he had to say on the subject would be received with the attention due, under such circumstances, from one practical man to another. (Hear, hear.) When he commenced using sewage near Rugby, it

was with a very strong idea of its great value. He was well acquainted previously with the sewage of Edinburgh, having for many years been in the habit of spending his winters there, and having seen enormous crops of grass, &c., which were obtained from the sewage of that city. Accordingly, when he went to reside near Rugby, and that town was put under the operation of the health of towns act, he was glad to enter into an arrangement securing to him the benefit of the sewage. He was to have sewage applied to his land in five dressings, extending from the month of March to the month of October, for the sum of one guinea per acre. At the outset, a question arose as to what constituted a dressing. It was left to the worthy alderman (Alderman Mechi) to say how much it was to be; and he decided that the quantity was 9,000 gallons, so that his five dressings in the year amounted to 45,000 gallons. No doubt the worthy alderman's experience, connected with his own tank and the application of the liquid manure on his own farm, was the foundation of that estimate. He told him at the time that he considered that amount much too small, but the decision was given and he submitted to it. He very soon found, however, that that quantity did not do. Applying the sewage by hose and jet in small amounts, he saw no appreciable effect, and he began in the very first season to concentrate the manure. Having laid down pipes, he tried it on green crops and turnip crops with little effect. Having tried it on grass crops, he found that when he applied a large quantity the grass grew luxuriantly, but when he used only a small quantity there was no result. Once during the winter season, in order to see what effect it would produce in winter, he had it applied by hose to a rood of land for some time continuously every day, the total quantity applied being very large. The next summer he took a number of people to look at the field, and no one could tell where the sewage had been applied. (Hear, hear.) So much for the winter application of sewage. It was perfectly true that sewage was a very valuable manure, but it was necessary that very large quantities should be applied within a very small space. (Hear, hear.) Every year he had been concentrating liquid manure on a smaller space, till at last the whole of the manure for which he paid £150 per annum was actually concentrated upon something like twelve acres of land.

Alderman Mechi inquired if that did not pay?

Mr. Campbell: Well he would tell the alderman. He wanted to allude to that four-acre and that five-acre field which were referred to in the report. Among the printed evidence which Alderman Mechi had just read, it was stated that the large amount of 9,000 gallons applied on one of those fields produced something like 33 tons of green forage; that the application of 6,000 gallons produced 25 tons; and that the application of 3,000 gallons produced about 15 tons. In considering results, however, they must remember how much depended on atmospheric influences. They could not judge from any one fact, because the temperature of one summer differed very much from that of another. (Hear, hear.) The last summer was, as they all knew, remarkable for damp and cold, there being very little heat; and he believed that when the results of the experiments of this year came before the public, they would be found very different from the results of the previous year. He held that the acre which had the largest

quantity of sewage upon it this year would be found not to have produced much more than the one which had only 6,000 gallons in the year before. The difference was entirely owing to the state of the atmosphere. He had no doubt, as the result of practical experience, that it required a large amount of liquid manure to produce telling results. He thought they ought to be on their guard against being carried away by any of the schemes which were set on foot for carrying liquid manure to their farms, and applying it to all descriptions of crops. (Hear, hear.) He was quite satisfied that it would not do for wheat crops, or for arable crops in general. (Hear, hear.) Again, although the grasses produced by irrigation answered admirably for the production of milk, they were not suitable for fattening cattle. The experiments made at Rugby under the government commission had quite set that question at rest. Grass of that description certainly would not fatten cattle, but it would produce milk to a very large amount. Some statements were put forth by Alderman Mechi which went to show how extremely valuable this grass was as regarded the production of milk. Among them was the statement of the different sums of money which, according to the report of the sewage commissioners, had been derived from so many acres of grass. In considering that question, due allowance ought to be made for the position of the town. (Hear, hear.) If the farms were near a country town, where the price of milk was very low, there must of course be a substantial difference between the value of the grass there and the value of the grass near London or Edinburgh. (Hear, hear.) He had been endeavoring to ascertain what was the fair price to pay for a ton of sewage grass. The first price which he agreed to give Mr. Lawes was 12s. a ton, and he gave the grass to his cows. Having tested the value as minutely as possible, he found that 12s. was too much, and accordingly the next year he paid only 10s. Twelve shillings was more than he could afford to pay for it, and he was not quite sure that 10s. was not too much; for it must be borne in mind that that was the best time for the production of milk, and that allowance must be made for winter keep of the cow, risk, labor, and so on. At all events he found that at Rugby it was not possible to give more than 10s. a ton for grass produced by the use of sewage. In Edinburgh, in the vicinity of which such a large quantity of grass had been obtained for a great many years, the retail price of milk was 16d. per gallon; in Rugby the retail price was 10d. In the neighborhood of Edinburgh, grass sold on the field for 8d. the cwt., or 13s. 4d. the ton; in the neighborhood of Rugby he paid 10s. A comparison of these prices would show that he paid more in proportion for the grass near Rugby than was paid for that near Edinburgh. These were things which people were too apt not to take into consideration. People looked at figures which they saw on paper, without reflecting on the variety of circumstances which there were to cause a difference between different places. There were differences of climate and of rainfall, there were different markets, and different soils, and such things required to be taken into consideration. (Hear, hear.) He wished to say one or two words about the committee of the House of Commons which sat last year. He for one was extremely pleased to hear that such a committee was assembled, because he believed it was taking the right method

of arriving at proper conclusions. The committee summoned people from all parts of the kingdom to give evidence, which was, of course, quite proper. But it was a very strange thing that men who wished to get at the facts of the case did not summon any practical farmer from Rugby. (Hear, hear.) He had been using the sewage at Rugby for about eight years, and he might surely, therefore, have been expected to know something about it, yet he was not summoned. Mr. Congreve, a man of great activity and intelligence, had also used it for some years, and he was not summoned; neither was the tenant who succeeded Mr. Congreve summoned. There was something in that which looked very like a foregone conclusion. (Hear, hear.) He had no wish to press hardly upon the gentlemen who formed that committee. He received a very polite letter from the chairman, in consequence of his having sent him a pamphlet which he had written some years before on the subject, intimating that his evidence and advice would be very valuable. About a week later he received another letter, asking for answers to certain questions which were inclosed. Those questions he answered to the best of his ability. One of them was whether he could give the quantities of sewage that he had applied. He replied that he thought there had been too much guess work already, and that he could not state accurately what the quantities were. The next day, in the exercise, no doubt, of a sound discretion, a letter was sent to him, telling him that his evidence would not be wanted. (Laughter.) Other questions related to the application of sewage to the various crops of the farm, to which he replied that he only now applied it to grass or other succulent crops. It is not, in fact, adapted for arable land.

Professor Voelcker (The College, Cirencester,) said he really felt some diffidence in addressing the meeting at that late hour of the evening, and that feeling was increased by the exhaustion of the subject; for he really believed that the subject was pretty well exhausted. They had learnt some valuable lessons from the discussion, but they had still to find out the best practical means of applying liquid manure to the soil. They had learnt the valuable lesson that it was useless to think of applying manure, so diluted as town sewage, in quantities of three, four, or five hundred tons per acre. If they wanted to get a good result, they ought to use large quantities. They had valuable evidence to that effect, and the evidence to the contrary was not of a description that inspired much confidence. One gentleman stated in evidence that small quantities answered as well as large quantities, if not better; he condemned the use of large quantities to the acre as a great waste of material, and at the same time stated that night soil was as valuable as Peruvian guano. If there were any meaning in this last statement, he supposed the gentleman meant weight for weight; he did not know what else he could mean. Evidence of that kind did not deserve much notice. Again, there was the valuable testimony of the Chinese, who merely scratched the ground (laughter), as if the farmers ought to imitate that practice. (Renewed laughter.) He (Prof. Voelcker) could not agree with the worthy alderman in thinking that the only thing wanted for all kinds of land was manure. There were soils which, with proper cultivation, did not want any manure at all. (Hear, hear.) With

deep cultivation and thorough plowing, these stiff clays, producing food in almost inexhaustible quantities, were soils which sewage manure not only did not benefit, but, in many cases, injured. (Hear, hear.) Therefore, manure was not the only thing required to increase our food supply. He purposely pressed strongly on this point. Having given evidence before the parliamentary committee, and having been suspected along with other agricultural chemists to have sold their better judgment to the manure manufacturers who were examined before the committee, he would now stand up for the soil as against manure, even at the risk of being suspected to favor too much the manufacturers of steam cultivators. (Laughter.) He repeated that he believed there were lands which required no manure, under good thorough cultivation. No doubt, sewage, where there was a proper soil to apply it to, was a most valuable thing. In many instances it had done wonders; but, on the other hand, they must not shut their eyes to the fact that in many other cases it was a nuisance, and would continue to be a nuisance if it were ten times as much concentrated as it is now. (Hear, hear.) They had had experience of its being a nuisance to many continental cities. In the case of his own native town of Frankfort-on-the-Maine, the sewage manure, undiluted, was of no great advantage either to the consumer or to the manufacturer. Various companies had been started for the purpose of turning this manure to account, and to none of them had it proved remunerative. It was a nuisance which could only be tolerated in an uncivilised country like China. In a civilized country it must be dealt with as a nuisance; and the question how it might be got rid of in the most profitable manner was a question worthy of the attention of the scientific as well as the practical man. These were some of the points on which he had intended to make a few remarks. There was one other which he must make, even at the risk of repeating the same thing too frequently. It was supposed by some that grass dressed with sewage manure had a higher nutritive value than unmanured grass. This notion was entirely erroneous; it was based on one of those scientific speculations which had no foundation whatever. Sewaged grass contained more nitrogen than undressed grass, but it was quite an error to suppose that the more nitrogen a substance contained the more nutritive it was. What were the facts of the case? That, in the same kinds of produce—say turnips or mangel wurzel—the larger the proportion of nitrogen there was, the less nutrition was there. So also was it with respect to grasses; in proportion to the quantity of nitrogen, the less nutritive was the crop. He had thoroughly tested that point by analyzing turnips at various stages of ripeness—the less ripe they were, the more nitrogen he found in them. It was the same with mangel. Let them compare a good, well-matured mangel, containing a large quantity of sugar, with one that was not properly ripened, and they would find in the latter case nearly two and a half per cent. of nitrogen in the dry substance; and in the former they would find only eight-tenths per cent., or about one-third of the other quantity. These were facts; and they could not be upset by any imperfect speculation or a wrong theory. They might rest assured that a large quantity of nitrogen in a plant always indicated unripeness and low fattening qualities. A contrary opinion might be put forth by others; but, when the matter was well exam-

ined into, it would be seen that what had been found out long ago by observant farmers was corroborated by scientific evidence. (Hear, hear.)

Mr. J. Marriage, (Moulsham Lodge, Chelmsford,) said he was loth to speak on this subject, because he had had only twenty-two months' experience. He had, indeed, had a little experience previously on his farm in Essex. Some years ago he applied there the sewage of a hamlet, adding to it a little land water, and it wonderfully improved his grass lands. About twenty-two months ago he went to Croydon, and saw the sewage in imperfect operation there, and the result was that he hired 312 acres of land which was to be irrigated, the board having had part of it in the first instance. The land was in a bad state of cultivation; there were great fences, and everything was as rough as possible, although the land was only ten miles from London. His attention was first directed to the knocking down fences, the grubbing up trees, and the cutting of carriers; knowing, to use the words of Alderman Mechi, that he had one million gallons of sewage water at his back to urge him on to spread upon the soil. He must say that, so far as his experience had extended, he was very well satisfied with the result. There was a very large amount of water, from one to two million gallons spring water and sewage per day, which he found amply sufficient to saturate something like 300 acres of land. Although there were only about twenty-five acres of grass land on the farm when he took it, he had leveled and laid down 250 acres in the twenty-two months. Some of it was, he admitted, in a rough state at present, because he had had so much to do. The time had not yet arrived for perfecting anything, but he would tell them what was his experience on this land up to the present time. In May, 1861, you could see a lark running about in one field, and by the latter end of July, in the same year, without any sowing whatever, as the result of passing sewage water over this land, it cost him about 10s. an acre to have the grass cut. (Hear, hear.) That was an example of the effect of applying sewage to natural grasses. He must add that he had found those natural grasses very fattening. In Essex he farmed about 500 acres, and if he had his cattle removed from his farm there to the natural grasses near Croydon, produced by sewage, he found them fatten twice as fast as they did on the Essex pastures, although he had very good meadows there. His Italian rye grass was mown last year, some four, some five times; it averaged four times. About June last year he sowed several fields with that kind of grass, and with the application of a little sewage he was enabled to mow it twice by the autumn. This year some of the fields which were thus sown last June looked beautiful, and he thought that in three weeks they would be fit for the scythe. (Hear, hear.) He certainly could not say anything, therefore, against the use of sewage. At the same time he ought to remark that the soil in his case was remarkably well fitted for sewage. It was a dark drift, fine mellow soil, lying on a gravel, and was very level. (Hear, hear.) In the whole 300 acres he did not believe any part of a single field rose two feet above the general level. Everything, in short, was favorable. (Hear, hear.) The result ought indeed to be such as he had stated, for he paid a rent of £1,550 for the 312 acres. The major part of the crops he hoped would be sold to the London cow-keepers. He

believed that the sewage of a town of 20,000 inhabitants would be sufficiently purified by passing over forty acres of land daily. One point which required to be settled was this: Where a town was comprised of say six, twelve, or eighteen thousand inhabitants, how—rather than what it was worth per ton—much land would be required thoroughly to take up the sewage? In his case there was no expense for pumping, and in that respect there were few places, perhaps, which possessed such an advantage. What he had mentioned were facts. He had no wish to say anything that was not practical, for in his opinion there had been too much theory mixed up with this question already. In about three weeks' time he should be happy to show from 250 to 300 acres of grass land to any one who would like to see it, and he believed it would not be found to disparage sewage irrigation. As to the fattening qualities of the grass, he stalled fifty cows, which produced a very large quantity of milk. When his cows were removed from Essex to Croydon they got nothing there but mown grass. He feared at first that he should hear reports of their scouring, and that some of the animals might do badly, but there had been nothing of the kind. The animals made flesh and kept healthy. He certainly considered sewage water to be very valuable for grass lands, under favorable circumstances.

Mr. Mechi would be glad to know what Mr. Marriage considered his grass to be worth per ton.

Mr. Marriage said that he had found that a beast would eat about one cwt. per day, which gave 10s. or 14s. per ton as the value.

The chairman, in closing the discussion, said he must congratulate the meeting that it had taken a different course from that which was taken by any previous discussion on the same subject. On former occasions the question had always been associated with irrigation; it had now been confined to sewage, and it had been treated in a business-like manner, which was very creditable to the club.

Alderman Mechi said he should best consult his own feelings, and probably also the wishes of the meeting, if he said very little in reply. He had depended principally on the evidence produced before a committee of the House of Commons, and he was very glad to have had a confirmation of that evidence in the remarks of Mr. Marriage, who could show the largest instance of sewage irrigation within about a hundred miles of London. If the grass produced near Croydon were of such fattening quality, it might be inferred that elsewhere the result would, under similar circumstances, be equally satisfactory. He quite agreed with those who said that the question turned on the cost of putting sewage water on land; but he could not agree with Professor Voelcker, or any other man, who said that, by being mixed with a certain quantity of rain or other water, sewage lost its qualities and ceased to be valuable.

Professor Voelcker said he had not made any remark to that effect.

Mr. Mechi thought that it was, at all events, a fair inference from what the professor said.

Professor Voelcker denied that such was the case.

The professor then proposed a vote of thanks to Alderman Mechi, as the introducer of the subject.

Mr. Braginton, of Torrington, Devonshire, after seconding the motion, adverting to the subject which had been discussed, said he held that in this case, as in many others, truth lay in the medium. He happened to live near a town where for ages a portion of grass land had been irrigated with sewage, and he was quite within bounds when he said that that land was of double the value of any other land in the neighborhood. Seeing this, he tried irrigation on a small scale with a horse and cart, and it was a complete failure. He believed that in many cases the sewage of London might be turned to good account; but if applied to land by an expensive process, there would, no doubt, be failure. (Hear, hear.)

The motion was then put, and carried unanimously.

DESTRUCTIVE INSECTS, AND THE IMMENSE UTILITY OF BIRDS.

Extracts from a pamphlet dedicated to agricultural societies and schools. By Frederic De Tschudi, President of the Agricultural Society of Canton St. Gall, Switzerland. Translated from the second French edition, by Henry L. B. Ibbetson.

That we may the better understand the importance of birds to mankind, let us examine the lives and habits of these little creatures, and the position assigned to them in the marvelous economy of nature. A simple view of their organization and mode of life will at once show us that the orders of birds whose daily and principal food is drawn chiefly, if not entirely, from the animal world, are those which exist both in the greatest numbers and the greatest variety. In Germany and Switzerland 150 different species are known, some sedentary, others more or less nomadic. The most numerous order of all is that of the Insectivora, which includes the warbler (*Sylvia orphœa*), the yellow wren (*Sylvia trochilus*), the stone chat (*Saxicola rubicola*), the lard (*Alauda*), the Alpine warbler (*Accentor Alpinus*), the white wagtail (*Motasilla*), the field lark (*Anthus arboreus*), the great titmouse (*Parusmajor*), the spotted fly catcher (*Muscicapia grisola*), the throstle (*Tardus muscuis*), the great cinerous shrike (*Lanius excubitor*)—the order numbering altogether more than 80 species. Few of these eat vegetable food, by far the larger number living exclusively on animals. The next most numerous order—that of the palmipedes—of which there are about 40 species (some of which are rarely seen in these countries), also lives for the most part on animal food. Swans do not disdain it; geese are the only members of the order which steadily refuse it. The Grallæ, which form a group of about 30 species, are almost entirely dependent on animal food. Birds of prey—Rapaces—numbering as many species as the preceding order, of course feed exclusively on animals; whilst of the family of the Gallinæ, in which there are about 20 known species, the following members prefer animal food: The water rail (*Rallus aquaticus*), the common loot (*Fulica atra*), the partridge (*Perdix*), wood grouse (*Tetruo*), bustards (*Otisturda*), do so at certain periods. The Zygodactyli, consisting of 12 species, are very eager after animalculæ; the European nuthatch (*Sitta Europæa*), the wryneck (*Yuuz torquilla*), and possibly the woodpecker (*Picus*) and cuckoo (*Cucullus canorus*), being the only ones which in autumn eat berries and seeds. The order of Granivora, which includes the families of the chaffinch (*Fringilla*), the house sparrow (*Fringilla domestica*), the serinfinch (*Fringilla serinus*), the linnet (*Fringilla lissota*), the bunting *Emberiza*), the hawfinch (*Loria locothraustes*)—in all about 30 species—have not a full right to the name which their order bears, since all the buntings, all the chaffinches and all the sparrows consume during the summer as much animal as vegetable matter, if not more. The only birds

which feed exclusively on vegetables are the pigeon tribe, including five species.

Thus one order only, comprising but one single family, together with a few scanty families taken from other orders, forming when put together but one-twelfth or one-thirteenth part of our birds, constitutes the total of those which exclusively consume vegetable food. There is also another fact not devoid of interest to the agriculturalist, viz., that the Granivora principally choose and prefer the seeds of obnoxious plants, of which they destroy vast quantities.

This rapid survey is suggestive of highly important considerations. It brings under our notice the great and invariable harmony existing in nature in the distribution of the earth's produce; for when we come to consider the sort of animal food that birds make use of, we cannot deny that they tend to the preservation of the vegetable kingdom. In effect, all the Insectivora, the Zygodactyli, the Grallæ, nearly all the Palmipedes, the species of Gallinæ and of Corvi, a part of the Granivora, and even the greater number of the Rapaces, either feed exclusively or partially on those classes of animals, such as beetles, caterpillars, larvæ, flies, Neoroptera, Hymenoptera, Rhinosinus, spiders, Crustacea, worms and Mollusca, which, by their extraordinary powers of reproduction, threaten, and sometimes more than threaten, to destroy the vegetation existing on the earth's surface. Many of the large birds feed also on mice and reptiles, which, though insectivorous themselves, would end in being troublesome through their numbers. Truly, Providence does not, to our mind, always make use of the simplest and shortest way of realizing its objects; but its views are themselves so varied that innumerable agents are constantly at work to secure the end. It unfolds itself in a thousand different shapes, and displays its wealth in apparently contradictory contrasts. Thus in the insect world we meet an assigned limit, combined with infinite variety of form and immense profusion of species. Like Birds and Mammalia, it possesses its Herbivora and Carnivora most wisely distributed. Where vegetation is most luxuriant, we find more Coleoptera than Phanerogama; and amongst these beetles the Herbivora predominate. In mountainous districts Phanerogama surpass the Coleoptera in numbers; whilst in the higher regions of the Alps these last disappear long before the former; and amongst the insects and spiders which exist beyond the limits of eternal snow, the Carnivora are more numerous than the Herbivora, this arrangement being evidently for the express purpose of protecting these last and scanty remnants of vegetation.

The vegetable world is the base on which the higher orders of creation are built up. Without plants animals cannot exist; for even the Carnivora are indirectly dependent on vegetation. If Providence is pleased to produce innumerable hosts and varieties of the smaller animals, it imposes, as it were, a certain limit on itself, by proportionately and gradually placing, where necessary, numbers of Carnivora; and if the wide-spread tribe of birds be destined to feed on animals of an inferior order, it thus provides a means for the maintenance of a perfect balance between the protectors and destroyers of vegetation. Birds are nature's soldiers, and keep in subjection the inferior animals. If some amongst them constitute

an excellent part of the food of man, furnish him with eggs, with useful feathers, or with a good manure, all these services are scarcely worthy of notice when compared with their labors in the destruction of insects. For this especial duty the most essential of their organs have been adapted—their sight is piercing, and even the very smallest among them possess the most extraordinary powers of digestion—whilst their great activity and lightness enable them to exercise their calling incessantly, and where most required. The reproductive powers of birds and their instinct of migration are also due to the office imposed upon them. When in the North the insect world drops into its wintry repose and sleeps under layers of deep snow, then most of the bird tribe fly to the South, there to perform the same duties; whilst those which remain all the year round in one place gather up the larvæ, the eggs, the nests of insects, the few flies or spiders which may be tempted out of their holes by a sun-ray, and the Coleoptera, which gnaw the barks of trees.

In these days it would almost appear as if the great and important services rendered by birds were insufficient for the purpose; for complaints are heard from Germany and Switzerland that they are invaded by swarms of those varieties of destructive insects which are habitually seen in small numbers only. They lay waste green meadows, vegetable gardens, crops of wheat or flax, fruit trees and forests; they torment alike animals and men, take us by surprise, and destroy our prospects. Amongst the beetles, the cockchafer is our most declared enemy. When in its last stage of development, it destroys the blossoms and leaves of trees; but, still more dangerous in its larvæ state, it gnaws the roots of plants, and, appearing in alarming masses, often devastates whole countries. This beetle might be made use of in more ways than one. In the first place, its carcass is an active manure, a good food for fowls, or, if well dried, even for cows, whose milk it will then increase. Some chemists have succeeded in extracting from them a good brown color and a good Prussian blue; much oil, too, can be got out of them, sixteen measures of cockchafers giving six measures of oil. A clear gas and a fair sort of cart-grease may also be manufactured from them; whilst cooks even turn them into a nourishing and savory mess or a sweetmeat for dessert.

All this is doubtless very well in its way; but if we do not steadily persevere in our labor of limiting, to the utmost of our power, the number of cockchafers, they would in the long run ravage so many lands, that neither hens, cows, cooks, nor chemists could by any possible means exist. Other destructive beetles are the *Acauthopoda*, the *Astynonuisaedile*, the *Authonomus*, the *Bostrichus typographus*, which in 1780 and the following years destroyed more than a million of fir trees in the Hartz mountains and in Switzerland, and more recently committed other awful depredations; and lastly the *Hydrophilus atsi*, a very dangerous insect for preserved fish-ponds. Several species of butterflies, otherwise so innocent, belong, when in the caterpillar state, to the class of pernicious articulated animals; the principal of these are the *Bombyre processionea*, the *Phalena bombyre*, the *Pieris*, the *Lasiocampa*, the *Phalena*, the *Neustria*, and the *Tinea*. As for the other sorts of inferior insects, such as the Gryllotalpa, the *Aphis*, the grasshopper, the ant, different species of the gadfly, wasps, flies, worms,

and snails, it is almost needless to speak of them; they are but too well known as plagues. The *Acridium migratorium* has already penetrated into southern Switzerland, and we are forced to the conclusion, from observations carefully made on different spots, that the number of destructive insects in general is gradually augmenting. This arises evidently from the diminution of insectivorous birds, which is in exact proportion to the increase of insects; and if we look into the causes of this diminution, we shall find more than one, both in this and other lands. Generally speaking, the progressive cultivation of the earth is not very favorable to animals living in freedom. It has driven the fallow deer from our woods; the elk, the lynx, the wolf, the bear, the ibex, from our mountains; the beaver from our rivers. But it has been especially hostile to birds; the hospitable thickets diminish yearly; man forces onward the limits of his domain; he masters the as yet uncultivated soil, and draws from it rich harvests. Large tracts of woodland are cleared to supply the wants of an increasing population and the heavy demands of industry. The large trees formerly left standing in the midst of a field, in which numberless small animals found refuge, are made away with, or replaced sometimes by the small fruit tree. Long rows of hedges, the hiding-place of a whole host of birds, meet with the like fate; and these, too, were of other use, for they attracted quantities of caterpillars, which fed on their green leaves, and thus spared the orchards. All the little nooks so useful to birds, both as hatching-places and hunting-grounds, disappear one by one. In woods, the mistake of cutting down, right and left, old trees full of small holes has been unfortunately understood too late, and thereby numbers of the best insectivors have been deprived of commodious nesting places. Unavailing regrets from those incessantly exposed to the havocs of wood insects will follow on the disappearance, for years to come, of their best and most active allies of the forest. United, the causes we have just referred to would alone be sufficient to explain the heavy and sensible diminution of small birds, but there are others of considerable consequence; for instance, the frequent netting and shooting by man, and the destruction of nests by children and cats. In some countries no nest is out of reach, and none are left unplundered; and it is especially the most useful destroyers of insects which are plundered in quantities, such as the titmouse, the chaffinch, the warbler, and the redbreast. Nightingales in some places have become so scarce, that in spots formerly enlivened by their songs every spring, they have not been heard for more than ten years. Here and there the absurd ordinances, enjoining every government keeper to destroy woodpeckers and cuckoos, and even offering a premium for every head brought in, are still the law of the land.

But the cause which exercises a still more fatal influence on the diminution of our most useful birds of passage, is the exterminatory hunt they are subjected to on the part of Italians. It is a well-known fact that at the period of their spring migration, and still more in autumn, Italians are seized with a mania for killing small birds. Men of all ages and conditions, *nobili*, merchants, priests, artisans, and peasants, all abandon their daily tasks to attack, like banditti, the troops of passing visitors. By the river side, in the fields, all around is heard the report of firearms; nests are

laid, traps set, twigs covered with bird lime hang on every bush. On every hill adapted to the purpose, is placed a sort of trap (*roccolo*) full of owls and sparrow-hawks, to attract and slaughter the little stranger. The objects of their pursuit are not those birds which, in other countries, are usually chosen for purposes of sport; on the contrary, they select the little insectivora, the singing birds, and particularly the nightingales. Swallows, even,—birds generally protected by man—are taken in quantities, and often in a most cruel manner. A small insect or feather is attached to a hook, held by a long thread, and allowed to swim in the air to attract the swallow as it skims past. To form some idea of the slaughter which for weeks together is the chief delight of the population of Italy, it is sufficient to mention that in one district, on the shores of the Lago Maggiore, the number of small birds annually destroyed amounts to between 60,000 and 70,000; and that in Lombardy, in one single *roccolo*, 15,000 birds are often captured daily. In the neighborhood of Bergamo, Verona and Brescia, several millions of birds are slaughtered every autumn, and the exterminatory fever rages quite as violently in the more southern districts. In Sicily, for instance, during ten days in autumn, nearly 1,000,000 of larks arrive daily on the coast, and immediately on their appearance are met by a continuous file-firing from hundreds of sportsmen, who bring them down in thousands.

This purely Italian* mania has penetrated into Switzerland, in the Canton Ticino, where no prohibitory laws exist to prevent the increasing fondness for the sport. The inhabitants entrap on the frontiers of their canton, on the St. Gotthardt and the Grison mountains, as many of the songsters, when they attempt to migrate, as they possibly can. But we on this side the Alps especially suffer from such wanton proceedings, and we witness the consequences in our fields and woods. We cannot prevent the Italians from indulging in their absurd and barbarous amusements, but we can lessen the evil in some degree; and it would be but consistent with the proverbial good sense of us Germans if we were to protect all the bird tribe with a solicitude proportionate to the mad attacks made upon them southwards, and thus in some degree reinstate the order of nature, and aid in re-establishing the necessary balance between the insect world and its enemies. We have two ways of accomplishing our object, by favoring in divers manners the propagation and increase of our most sedentary birds, and by affording good asylums and hearty protection to birds of passage during their summer sojourn.

It is, however, preposterous to depend entirely on artificial means for a complete restoration of nature's laws. The force of reproduction is so prodigious amongst inferior animals, that man will never be enabled to combat alone successfully their periodic invasions. On the borders of the Rhine, the *Attelabus Bacchus* damages the vineyards, and the *Anthonomus* and *Phalena* the fruit trees to an extent which may be valued at several hundred thousand thalers (3s.) annually, without a remedy against such havoc having as yet been found. Near Torgan, several thousand thalers have

*M. de Tschudi forgets to mention the passion for *mauviettes* existing in the south of France, which national dish is nothing but a fry of every description of small birds.—*Note of English Translator.*

been annually expended on the forest of Annaburg for the destruction of caterpillars and chafers, in the attempt to save the trees from utter ruin. During the year 1537, an area of 860 acres of fir forest was entirely stripped of its leaves by the caterpillars of the *Noctuæ*, and government paid more than 1,000 thalers for the destruction of 94,000,000 of the above dangerous insects. The havoc these insects cause is almost incredible. Some time ago caterpillars devoured all the grass over immense districts in America, and it was found necessary to import hay from England. The Herbivora caterpillars laid bare the plains of Lesch, near Augsburg, gnawing the roots of every plant and destroying the herbage growing for miles around several villages. The caterpillars of the *Noctua pleuipeda* will in a few weeks' time destroy 300 acres of woodland; and in the marshes of Brandenburg, in two years, they devastated a seventh part of all the government forests. In Franconia, the caterpillars of the *Bomlyx* and *Lasiocampa*, during the year 1839, completely devoured the produce of 2,200 acres of government forest, in spite of the strenuous efforts made to combat the evil. A success was obtained in the woods of Straulsund, where, in 1840, government, at an expense of about 3,200 thalers, collected 1,000 pounds weight, that is, more than 633,000,000 of the eggs of the Bomlyx. The vegetable-consuming caterpillar occasionally appears in such numbers that a tubful of them may soon be collected. They arrive in a field, quickly destroy the chief part of the crop, and then journey on, it being impossible to arrest their progress. It has been noticed in the Duchy of Hesse that these insects principally laid waste those spots where, from the want of trees, the aggregation of singing birds is prevented, and here all human efforts at prevention have been found totally unavailing.

For about half a century the culture of fruit trees has been steadily increasing in Wurtemburg, so that now it brings in a revenue of 1,700,000 florins, (£141,700) annually, though a great part of the crop is yearly devoured by caterpillars. Formerly but little notice was taken of these invaders, but latterly they have so much increased that many cultivators have been discouraged from continuing their occupation. Government has ordered all the trees to be cleansed, both in spring and autumn, imposing penalties for disobedience, but the desired result has not yet been obtained. If nature did not interpose, man would of necessity succumb; but these insects are pursued by other enemies, who become the allies of man. The *Ichneuman* pricks the caterpillar to death; the *Limex* sucks out its vital organs; beetles eat them, principally the pernicious *Proceprones* caterpillar; and the shrew-mouse, the hedgehog, the mole, the lizard, the frog, the toad, and the bat, are all excellent insect hunters. Nature, however, has shown most solicitude for us by appointing, as the food most sought for by birds, eggs of caterpillars, larvæ, caterpillars, butterflies, flies, gnats, aphis, ants, snails, worms, etc., and by giving to each species its assigned duty and place in the work of destruction. Each has its appointed spot, either in the wood, field, bush, meadow, garden, or vineyard, on the rocks, or by the river side; some attack one particular class of insects, others another; some are clever at pecking them off leaves or branches, others snatch them up as they fly through the air; some unearth them, others extract them from betwixt bark slits, or pierce

the wood that shelters them. Each sort of bird is expressly formed for the task it is intended it should perform, in the varied shape of the beak, feet and wings, and each little workman finds it necessary for its sustenance to swallow daily an amount of matter equal to the weight of its own body.

In order duly to appreciate the immensity of the work undertaken by birds, we will just notice a few facts brought under our observation. In a green-house, three full-grown rose bushes were covered by about 2,000 of the aphis; a black cap (*Parus palustris*) was introduced and allowed to roam about in freedom, and in the space of a few hours the whole multitude of insects was consumed, and the plants thoroughly cleansed. The titmouse fortunately multiplies considerably; they render great service, chiefly in shrubs and fruit trees, eating up millions of caterpillar eggs. Every one is aware of the enormous quantities of eggs caterpillars lay at one time; some species 150, and others 500, 600, and even 800. The *Noctua*, for example, lays about 600 eggs twice each summer. The titmouse, like most other birds, does not attack the hairy caterpillar, but it daily swallows thousands of its eggs. Constantly in full activity, both in summer and winter, they are ever rummaging about trees, sometimes in small groups, and sometimes accompanied by the European nuthatch (*Litta Europœa*), the common creeper (*Certhia familiaris*), and the gold crested wren (*Motacilla regulus*). They creep into rolled-up leaves, under branches and trunks of decayed trees, and diligently make away with every insect egg they may chance to stumble upon. Count Casimir Waszicke mentions a conclusive example of the signal services these birds render to our gardens.

"During the year 1848 an enormous quantity of the *Bomlyx dispar* (the well known enemy of gardens, and which also commits serious depredations in woods) had devoured the foliage of my trees so that they were quite bare. I discovered, in autumn, millions of eggs enveloped in a silky sort of covering, and attached to the trunks and branches. I had them removed at a considerable expense, but soon became aware that the hand of man was powerless to ward off the infliction, and resigned myself to the loss of my best trees. But on the approach of winter several bands of the titmouse and the wren (*Sylvia troylodytes*) paid daily visits to my trees, and soon the caterpillar eggs were in a fair way of diminution. At spring time about twenty couple of the titmouse built their nests in my garden; the ensuing summer the depredations of the caterpillars were greatly lessened, and 1850 my little winged gardeners had so well cleansed all my trees, that, thanks to their labor, I had the satisfaction of seeing them in full leaf the whole of the summer."

The indefatigable wren, which remains with us during the winter, is of very great use, for its appetite equals its activity. They must perpetually be swallowing something, and accustom their young to follow their example in gluttony, by feeding them on an average thirty-six times every hour with insect eggs, larvæ, &c. A hungry redstart (*Sylvia tithys*) captured in a room, during the space of an hour, 600 flies; and if this little animal hunts but for two or three hours a day, we may guess the number of its prey. The swallow and the martin (*Cypselus*) in the day time, and the European goat-sucker (*Caprimulgus Europœus*) during the night, capture swarms of

gnats; the chaffinch, the jay and the jackdaw (*Corousmonedula*) devour the *Lasiocampa* and *Noctua*. Even sparrows may be included in the list of useful birds, notwithstanding the damage they cause at times to the orchard or corn field, because they feed their young (which have very good appetites) exclusively upon larvæ, grasshoppers, caterpillars, beetles, worms or ants; and both old and young at the end of summer are constantly filling their crops with the seeds of weeds. A couple of sparrows will consume in food for their young about 3,000 insects weekly, each parent bringing a billful thirty times an hour. These services are well worth a few cherries. The field sparrow does not, moreover, eat cherries, and a small number of these birds will soon cleanse many shrubs and rose trees from the aphis.

Frederick the Great, King of Prussia, being very fond of cherries, one day ordered a general crusade against the sparrow tribe, some of them having ventured to peck at his favorite fruit. A price of six pfennings a bracewas set on them; consequently throughout Prussia the war was briskly carried on, and so successfully that at the end of two years not only were cherries wanting, but most other fruits. The trees were covered with caterpillars, and completely stripped of leaves; insects had increased to a most alarming extent, for other birds had been frightened away by the extraordinary measures taken mainly against the sparrows. The great king was obliged to confess to himself that he had not the power to alter that which had been ordained by a still greater King than he, and that all attempts at violence and wrong were sooner or later avenged. He retracted his decree, and was even obliged, at a considerable expense, to import sparrows from afar; for these being birds of obstinately sedentary habits, would never have returned of their own accord. When field sparrows feed in a corn field they ought merely to be warned off, not killed, unless, indeed, there be many insectivorous birds near at hand. Sensible gardeners every year more and more discourage the slaughter of sparrows.

All the species of warblers (*Sylvia orphœa*), the red wren (*Arundinacea*), the yellow wren (*Motacilla alba*), the stonechat (*Saxicola rubicola*), as well as the different sort of shrikes (*Vanius*), are excellent insect hunters, and particularly the spotted fly-catcher (*Muscicapia grisola*), which bird it is better to keep at a distance from bee-hives, whose vicinity it frequents. In vineyards the blackbird does not compensate by its services for the damage it causes to the crop; but in other places they ought to be protected, for they devour numbers of the destructive earth caterpillar—a task also performed by the agile common stare (*Sturnis vulgaris*), which likewise delivers cattle at pasture from worms, flies, gadflies, &c.

Swallows are most active insectivora. We should therefore protest against the custom of capturing them for food, which prevails in some parts of Germany. We should intercede also for the lark, who, though of use to the agriculturist, finds here an implacable enemy in man.

We will now just take notice of a few of the larger class of birds, which are of very important use to our different sorts of culture. The cuckoo is the first on the list. Nature has formed this very remarkable bird for the express destruction of hairy caterpillars, which other birds cannot eat, and has organized its stomach for the easy digestion of such food. In

1847 an immense forest in Pomerania was on the brink of utter ruin, caused by the havoc of caterpillars. It was suddenly and very unexpectedly saved by a band of cuckoos, who, though on the point of migrating, established themselves in the place for a few weeks, and so thoroughly cleansed each tree that the following year neither depredators nor depredations were to be seen. The cuckoo, like the smaller insect eaters, eats all the day long, for the caterpillar is full of watery matter, and contains but little solid nutriment. By careful observation, it was ascertained that the cuckoo devours one caterpillar every five minutes, or 170 in a long day. The hairy stuff sticks to the mucus membrane of the bird's stomach, so as often totally to cover it. If we assume that one-half of the destroyed insects are females, and that each contains 500 eggs, one single cuckoo daily prevents the reproduction of 42,500 destructive caterpillars. How many men could do the like in one day?

The race of woodpeckers almost rival the cuckoo in utility, and, though unappreciated, are the good genius of our woods. They are full of vigor and courage. When we pass under a tree, how eagerly they look down upon us, seriously and attentively, with their clear brilliant eye, almost saying, "Friend, dost thou well comprehend the full utility of the work we have on hand? If not, pray be attentive and bear witness to it hereafter!" Their chief victims are very mischievous insects, such as the *Noctua*, the *Lasiocampa*, the *Sphinx pinastri*, the *Tisodes pini*, the *Hylurgus piniperda*, &c. The green woodpecker (*Picus viridus*), and the grayheaded woodpecker (*Picus canus*), are especially distinguished for their skill in putting to death wasps, whose sting avails naught against them. The greater spotted woodpecker (*Picus major*) is ever on the look out for insects and larvæ; the three-toed woodpecker (*Picus trydactilis*), as well as the great black woodpecker (*Picus martius*), much prefer the *Coleopteralibriola*. Another important item in the history of those birds, lies in the fact of their being the forest bird carpenters in ordinary. Every woodpecker, in the course of the year, drills at least a dozen holes in the trunks of trees, not only constructing as commodious and pretty a nest for hatching as possible, but also resting places in which he lodges for a few nights at the period of migration. When at his work, shavings several inches in length are observed to drop to the ground; and in such like cavities hosts of small insectivorous birds find convenient retreats for laying and hatching fully prepared ready to hand. It is acknowledged that this operation of the woodpecker causes no injury to woods, as they on no account work upon healthy trees, but prefer decayed ones which are beset by insects.

Even amongst birds of prey (*Rapaces*), many insectivora are to be found, and such of them are worthy of protection. All the smaller birds of prey, and some of the larger ones also, feed their young on insects, and they themselves, when hatching, hardly touch anything else. The most useful members of the order incontestibly are owls, which being extraordinarily gifted for the work, devour in their twilight haunts considerable quantities of forest insects, principally night butterflies and their caterpillars. Some species of the owl are noted, together with the rook crow (*corous frugilegus*), the jackdaw, the jay, and the great cinerous shrike, for their destruction of cockchafers. A twany owl (*strix stridula*) was once dissected

at Berlin, and its stomach discovered to be full of insects, and amongst these were at least 75 caterpillars of the *Sphinx pinastri*. In the destruction, as well, of field mice and rats they render services whose importance is but seldom recognized. The English naturalist, White, once watched for a length of time a pair of white owls (*Strix flaxinea*), and noticed that they brought a mouse to their nest, on an average, every five minutes. A couple of the little owls carried to their young eleven mice in the course of an evening in the month of June. Nothing is more absurd than the way in which these birds are hunted down by ignorant plowmen, whose chief delight is to have a few of them nailed up against the barn door; they might as profitably nail up their cats (who frequently snatch up a fowl or two), for the owl nightly makes away with more mice than the best of cats. In the stomach of twenty dissected owls nothing was found but mice and moles. The great-eared owl (*Strix bubo*), is, however, much less deserving of our sympathy, for besides frogs, serpents, lizards, mice, &c., this bird often falls upon barn-floor fowls and useful quadrupeds. A great number of diurnal birds of prey, such as the sparrowhawk (*Falco nisus*), the kite (*Falco milvus*), and the harpy (*Falco rufus*), are mischievous, for they slaughter indiscriminately the more diminutive useful birds, and the smallest of their class devours as many birds as insects. Still, the kestril falcon (*Falco tinunculus*), not at all a scarce bird with us, eats so many beetles, grasshoppers, and field mice, that its utility in this respect amply repays the harm it may cause. The same description is applicable to the hobby falcon (*Falco subbutes*). A flight of the last birds lately passed over the Canton de Vaud, and alighted on the trees standing round the village of Nouvion. The inhabitants, fancying them to be pigeons, killed a few, but when they saw the eagerness with which the bird sought after and devoured cockchafers, they soon desisted from their ignorant amusement. The most useful, and at the same time most common bird of prey, is the common buzzard (*Falco buteo*), so often mistaken for the injurious goshawk (*Falco palumbarius*); it destroys immense quantities of rats, mice, snakes, &c. More than 20 mice have been found at one time inside one of them, and Steinmuller once dissected a bird of this class, and found no less than 7 *Angis fragillis* and 13 *Gryllotalpae* in its stomach. The annual consumption of one single bird has been computed at about 4,000 mice. Perched upon a bush or high stone, the bird watches for hours the preceise instant when the mole or rat approaches the surface of the earth; it then eagerly drops down, inserts its claws deeply in the soil, and snatches up the animal. The brown mark around the belly, and the heavier flight, are signs sufficient to distinguish it from the terrible goshawk; these marks ought to be attentively studied. The honey buzzard (*Falco apivorus*) is also a great mouse-eater, besides which it also swallows caterpillars, wasps, and horseflies, hooking them out of their nests, and devouring them together with their eggs. These two last mentioned buzzards are certainly hurtful to other birds, but their utility compensates for all mischief; besides they are heavier, slower, and less alert than the goshawk, and therefore do not destroy nearly so many victims.

It is not my intention here to call attention to all the useful birds in detail, but merely to some of the most remarkable of them, with a view to

showing how great is their importance to all branches of agriculture. Without these creatures agriculture and vegetation would be impossibilities. They perform a work which millions of human hands could not do half so completely.

We have yet to treat of an order of birds, numbering several families, which appear in great numbers and play an important part in the economy of nature, we mean the crow (*Cordus*). It is difficult to judge them all in one body, for the different species vary in their mode of life. The jay belongs to this class, which destroys quantities of insects but damages the seeds of forest trees, and attacks nests of small birds, devouring their eggs and young; it is remarkable also for its destruction of venomous vipers. The jay is hurtful to many crops; it has been seen to tear off a wheat ear whilst in full flight and swallow it whole. The same may be said of the carrion crow (*Cordus cordus*), which at the laying period behaves like a real bird of prey, and carries off quails, young ducks, partridges, and even leverets. The great raven (*Cordus corax*) still more closely imitates the birds of prey, and equally carries off young hares and rabbits, but it has one great redeeming point in its character, that of making away with dead and putrid carcasses. Magpies decidedly do more harm than good; voracious and cunning, they do not rest satisfied with young birds merely, but hunt perpetually those of all ages; the magpie, therefore, may be shot without compunction. The most innocent and useful members of the above order are the jackdaw (*Cordus monedula*) and the rock crow (*Cordus fougilegus*), which feed a good deal on cockchafers, snails, earthworms, mole-crickets and mice; therefore the two last species may be encouraged, whilst the rest ought to be kept in check if inclined to multiply rather too rapidly. Those few birds which live exclusively on vegetable products appear at first sight to be hostile to mankind, and to harm the cultivator. This apprehension is more imaginary than real; man is too much inclined to forget the great indirect profit he derives from the Granivora, and only to look upon the damage they cause at certain periods. Do they not destroy quantities of the seed of all sorts of weeds? and how can the agriculturist (as happens in most countries) look upon the wood pigeon as a real plague? Let him but take time to observe how those birds consume the seeds of the nigella, the wild poppy, and several noxious varieties of the euphorbium, which no domestic animal can eat, as noticed by Glauser. For the above reason pigeons are more strictly preserved in Belgium. The crossbill (*Crucirostra*) and the liskin (*Fringilla spinus*) eat, it is true, many seeds of trees, but they also consume great quantities of burdock seeds. Others, again, of the Granivora, the twite (*Fringilla linasia*), the brambling (*Fringilla montifringilla*), &c., eat abundantly of the seeds of plantain, wild poppy, burdock, chickweed, groundsel, sowthistle, and other noxious weeds. The bullfinch (*Pyrrhula*), on the contrary, commits depredations amongst blossoms, whilst the hawfinch (*Losia locothraustes*) despoils cherry trees to get at the kernel of the fruit. These two last species, however, do not often come in our way.

This rapid survey of the economy of nature is sufficient to convince us that we have numerous and vigorous auxiliaries always at hand to arrest the ever-threatening invasion of insects. It is our duty to aid their increase

and employ their energies for the advancement of agriculture. We must begin, then, by abstaining from shooting useful birds, by favoring their reproduction, and by familiarizing them with our persons. Bird-netting is an abuse unfortunately too frequently indulged in, but it ought to be banished from the vicinity of all cultivated lands, as being extremely detrimental to agriculture. If one only reflects how much the little creatures help to enliven our fields and gardens with their gay chirruping, their fine plumage, their active and lively ways; and how many victims are sacrificed ere one is secured to bear for a few short years the imprisonment of the cage, it is utterly impossible to feel any sympathy for bird catchers. If sport is to extend beyond the birds required for our use—if children find an amusement in entrapping the titmouse, the warbler, the nightingale, the chaffinch, the lark, the redbreast—is it not both a sin and a great folly, and will not the inevitable result be the total loss of our harvests and fruits? Why should we criminally interfere in the divine organization of nature? Why slaughter our firmest allies? Why lift our hands against our benefactors and protectors? If woodmen and peasants could be made to understand the immense services the cuckoo, the owl and the woodpecker render to mankind, they certainly would protect those valuable servants from the senseless destruction they are subjected to.

The governments of many German States have issued ordinances to prevent the indiscriminate slaughter of singing birds. This very good example has been set by Hesse, Baden, Wurtemburg and Prussia. In Saxony a heavy fine is imposed on any person found capturing a nightingale, and for every bird kept in a cage a tax of five thalers (15s. stg.) is levied. This law does not extend to Saxon duchies, nor the forests of Thuringia, where in every village no inhabitant is without his caged songster, and some have as many as thirty or forty different sorts. Free nightingales are therefore getting scarce there, and insects numerous. Many men of sense, such as Lenz, of Schrepfenthal, Glozer, of Berlin, Schott de Schottenstein, of Ulm, have zealously employed their talents for the protection of small birds, and have further advocated attention to their increase. This is an important object, which every one may in some degree promote. Every owner of a wood, field or garden, ought to spare old trees, in the cavities of which those birds who prefer hatching in obscurity, such as the titmouse, the common creeper, the wren, the owl, the common stare, the gray redstart, the woodpecker, etc., would find a proper asylum. If the dry leaves and detritus be taken out of such holes, and if, when they run perpendicularly down the trunk, a small board with an opening about two inches in diameter be nailed over, they will soon be peopled, and in a few hours the lodgers will amply repay the pains taken on their behalf. Let the little square boxes, which in some countries the law obliges people to hang out of doors for starlings, be imitated, and care taken that the young are out of all danger of being carried off. And when the thrush, the chaffinch, and others, make nests on a tree, let them be protected from children and cats by surrounding the trunk with a crown of thorns. To compensate the want of hollow trees for those birds which choose holes to hatch in, it is easy to make small boxes of common wood, closed on three sides, but having on the fourth a small opening left, and place beside them

a round piece of wood to serve as a perch. Such a little house should be placed facing eastward, under the cornice of a roof, or in the branches of some tree, at a height of from 10 to 12 feet from the ground, not too much under the shade of the leaves, and in a retired spot. These hatching boxes can be made of different sizes; the titmouse is very fond of a box of about eight or ten inches in length inside, and of three or four inches in height. Of course larger birds prefer roomier berths. These boxes should be painted of a dark gray color, and well garnished with moss. Much good has been done in this way, now that the importance of encouraging bird hatching is more generally appreciated in zoölogical gardens, agricultural schools, and horticultural establishments. Under the advice of men of science and of judicious land holders, many thousands of hatching boxes are being set up, and no outlay is more quickly remunerative. Whoever possesses a suitable piece of ground may give himself a real treat, and at the same time much gratify the winged gentry, by planting a small space thickly with thorn bushes, cherry trees, oaks, firs, etc., and covering the ground with branches of the prickly thorn, so as to prevent the intrusion of cats. Once established, the plantation will soon be the assembly ground of multitudes of small birds. They are very fond of such thickets, because of the sense of security they impart, and the influence of their vicinity will soon be noticeable. Many of these asylums have been such protection to large properties that fruit has ripened even in unfavorable seasons. During both winter and summer the grateful birds had been hard at work, and cleansed every tree from insects. Those who cannot form such thickets can at all events place just off the roofs of their houses or barns a rather broad lath, on which swallows will love to perch. More may be done for our own gratification, as well as that of birds, by placing a board, with a covering and side pieces attached to it to keep off snow or rain, out of the window of an uninhabited room, or in some out of the way corner; let it be kept plentifully supplied with crumbs of bread, little bits of potatoes, barley seeds, and elderberries, and the hostelry will be in very great request, especially during the winter season, and it will be gladdening to witness the mirth and good humor existing amongst the little visitors. Such a thing is easily arranged, and is of real benefit to the half starved bird, which soon gets accustomed to the hospitable house, and pays its debt of gratitude during summer time by loud songs and a zealous hunt after insects.

To fix the useful titmouse in one particular spot, these simple means are employed: a caged titmouse is placed on the branches of a tree, und the captive will soon attract its companions. If a few green fir branches be hung during the autumn on the bare boughs of fruit trees, they will, during the winter, be actively visited and regularly cleansed by the titmouse. It is well to come to the rescue of small birds, especially during the hatching season, and deliver them from their winged enemies, magpies (*Cordus pica*), ravens (*Cordus corax*), etc., whilst for the protection of fish ponds we must wage war against the common heron (*Ardea cinerea*) and the water-ouzel (*Anclus aquaticus*); but the capture and sale of the titmouse, the chaffinch and the redbreast, ought to be strictly prohibited, and the indiscriminate slaughter of insectivorous birds heartily condemned.

Reader, take the work of preservation to heart! You have looked into the admirable economy of nature which God has so wisely ordained and organized, manifesting his power even amidst the most minute objects. Contribute to the utmost of your power to maintain that order; it is both pious and wise to do so.

Feed and protect these birds; they will enliven your court-yards and gardens; they will come to you in full confidence, and await the crumbs given by your hands; they will build nests in your bushes, and amuse you by their activity and solicitude for their young; they will charm your ears with their songs of joy and gratitude; and if throughout the land they find both protection and comfort, they will largely and in a most striking manner requite the benefits received, by proving themselves to be the most faithful protectors of your fields and forests, orchards and gardens, and of cultivation in general.

TOBACCO AND HEMP.

ESSAYS ON THE CULTURE OF TOBACCO AND HEMP.

We have been favored with valuable essays on the culture of tobacco and hemp from L. J. Bradford, Esq., President of the State Agricultural Society of Kentucky. The cultivation of tobacco and hemp will undoubtedly increase largely in the Northern and Western States; and no more valuable essays than those of Mr. Bradford have been published. We are under great obligations to the author for these essays, and they are embodied in our Transactions for the benefit of our farmers.

Essay on the Culture and Management of Tobacco.

BY L. J. BRADFORD, OF AUGUSTA, KY., PRESIDENT OF THE KENTUCKY STATE AGRICULTURAL SOCIETY.

The success of a growing crop of tobacco depending much upon early planting, the selection of such situations for plant beds as will insure a proper exposure to the sun, is all-important. The eastern or southern slopes of hills, near their base, afford the best locations, the beds so situated being free from sobbing, and the warmth of the sun greater than upon flat surface. Regard should also be had to the character of the soil. It should be sufficiently close to render it retentive of moisture, and yet contain sand enough to give it quickness; made earths and puffy soils are unfit, being both too arid and liable to heave. Beds prepared in the early part of the season require more burning than those at a later period. There is but little danger of burning too hard, however, at any time, as the plants generally succeed best upon the beds most thoroughly burned. After the beds are thus burnt and cooled off, they are dug up with a common sprouting hoe to a depth sufficient to afford the plant a loose soil in which to extend its roots. Care should be taken to leave the surface soil as much on top, in the preparation of the bed, as possible, as the young plants will take a quicker and better growth. After the bed is well pulverized by hoeing and raking, the seed, mixed with dry ashes, is to be sowed as evenly as possible over the surface, at the ratio of a common table-spoonful to every eighty square yards (cubic measure), the bed lightly raked over or trodden evenly with the feet and well covered with brush, on which there should be no leaves, and protected from the intrusion of stock. So soon as the young plants attain the size of a dollar, the brush may be removed; if the weather is dry the brush may be suffered to remain to advantage, and when removed taken off in the evening; with seasonable weather, the plants will soon be large enough for transplanting.

The land designed for the crop should be fertile; if not naturally so, should be made so by manuring. Any common manure will answer a valuable purpose, tobacco being a plant that delights in a rich soil. The land should be deeply and thoroughly plowed, whenever practicable, in the fall or winter. In this there is a twofold advantage. 1st. It destroys many insects that injure or destroy the young plant. 2d. It renders the land more friable and more easily cultivated. As the season approaches for planting out the weed (which is here from May to July), the land should be plowed again and kept clean. It is then to be laid off with a plow three and a half feet one way and three feet the other, and a small hill made in or on the check, as may be preferred, for the reception of the plant. The hill should be raised a little above the common level of the surface—the size of the hill being a matter of fancy with the planter, and not regarded as a matter of consequence in general. So soon as the plants have attained a sufficient size for transplanting, they may be drawn from the bed and placed on the hills whenever there is moisture enough to prevent their dying. This is generally done after a shower; but should the land be very wet, it is best to wait until it dries or settles some, as the plant will do better set when the land is not too wet. The plant, if it survives the transplanting, will soon commence growing, and requires no attention until the weeds and grass begin to make their appearance, and must be subdued by the plow and hoe. Should the earth become hard about the plant, the hill should be lightly scraped. This will greatly promote the growth of the plant. When the plant becomes large enough, the bottom or plant leaves may be broken off. This is called pruning, and the land may then be deeply and thoroughly plowed, taking care not to injure the roots of the plant, and the plant hilled up by following with hoes, and throwing the loose soil around it. In land that has been kept clean, this may be the last plowing; the weeds and bushes may be kept down with the hoe, should any appear.

When the plant is large enough to top, the leaves nearest the ground are to be broken off and the bud taken out, leaving on the stalk the number designed for the plant. The number of leaves, as was remarked about the size of the hill, is much a matter of fancy; yet it has more to do in forming the future character of the tobacco than most planters seem apprised of. Experience has fully demonstrated that ten leaves are sufficient for a plant, and this is almost a universal practice among our best planters. The first plants, if the crop has grown off unevenly, may be placed to twelve leaves; the next topping may be ten, and as the season advances, the number may be lessened, as the appearance of the crops and season indicates. This will insure more uniformity in maturing of the crop, saves much labor, and adds to the value of the crop, making it more uniform in quality. At this stage of the crop the care and attention of the planter is almost constantly required to keep off the worms and other insects which prey upon it, and in breaking off the suckers which soon appear upon the stalk at every leaf. Ample employment may be afforded to every idler about the premises.

As the plant approaches maturity, it begins to thicken, and assumes a stiff, slick and motley appearance, which the most unpracticed eye will

readily detect. Should the weather be favorable (viz: dry), the first ripe plants may be permitted to remain standing until a sufficient quantity is matured to satisfy the planter in making a regular cutting. If, however, the weather be unpropitious, it is best to cut as fast as it matures, as it is subject to injury under such circumstances if suffered to remain too long. The harvesting of the crop is an important period in its cultivation, and neglect upon the part of the planter will bring loss in its future value. In cutting the plant, a sharp knife is to be used, and the stalk to be split about half its length, taking care not to break the leaves or otherwise injuring them, and the plant to be set with the butt of the stalk up, exposed to the sun. So soon as the plant is wilted enough to handle without breaking, they should be taken up and laid in a heap of seven to nine in a place, being governed by their size, and hung as soon as possible to prevent being scorched by the sun. The after part of the day is best for cutting; there is less danger of getting the plant sunburnt. The sticks upon which the plants are hung are small pieces of timber four feet long, and of sufficient size to support the plants. These are taken to the barn on a cart or wagon after receiving the plants, or may be placed upon scaffolds in the fields, at the option of the planter. If the weather is fair, it is best to sun it, as it aids the curing, and adds to the strength and elasticity of the leaf after it is cured. Care should be taken not to place the sticks too close, if the weather be damp and warm, as there is danger of injuring the plant. After remaining on the scaffold a few days it becomes yellow, or assumes the color of a leaf in autumn; it must then be carried to the barn or curing house, and placed away, keeping the sticks far enough apart to secure a free circulation of air through them. If the weather is wet, it is best to take the plants to the house at once, and let the yellowing process take place in the house rather than risk the changes in the weather, as rain is always injurious to the plant after it is cut, and especially so after it becomes yellow.

The curing process is one of the most important in the future value of the crop, and too much care cannot be given it, a small neglect lessening the value of the crop seriously. If the weather is dry and the tobacco is not too much crowded in the house, the action of the atmosphere, assisted by a small portion of fire, will be sufficient to effect the object. If, however, the weather is warm and damp, the atmosphere will not aid very materially in curing the plant, and unless firing is resorted to, the plant is certain to be more or less injured. It is always safer, after a house is filled with green tobacco, to rely upon the action of the fire to a considerable extent. This should be small and slow at first, and continued so until the tobacco is clear of the moisture engendered by the fire, and then increased until the leaf is nearly cured. When this is the case, the fires should be suffered to go out, and the tobacco be suffered to come in case, or get soft again. The quality of the article will be improved by permitting it to come in case once or twice before it is thoroughly cured in stem and stalk. Dry and sound wood is best for firing. If the object of the planter is to make a piebald or fancy article, care should be taken never to permit the leaf to get very soft during the curing process; and to make a really fancy article, the tobacco must be thoroughly yellowed

before, and cured entirely by fire. This particular description is, however, not more desirable or valuable to the consumer, as the essential properties of the plant are frequently destroyed by the action of the fire. As a general thing, it is better to cure the weed by a natural process of air and the action of the atmosphere; and where the planter is provided with a sufficient quantity of room to house the crop without crowding too close, the object can be attained without the aid of much fire, and the wood and danger of burning the crop saved, and in some markets increase the value of the crop.

Having now arrived at the time when it is supposed the planter has secured and cured the crop, we proceed to give some directions in its future management and preparation for market—remarking that many, after all their previous care and labor, lose its profits to a good extent by either a want of knowledge as to its management, or a carelessness which is inexcusable upon their part.

After the tobacco has been thoroughly cured in stem and stalk, it is then ready to commence stripping, or taking the leaves from the stalk. In this process the plant first passes through the hands of the most experienced laborer on the farm, who takes off the bad or injured leaves and ties them neatly in bundles of eight or ten. The plants that are thus culled are given to others who strip off the remaining leaves, and tie them in bands of six or eight leaves, wrapping tightly and neatly, with the tip of the leaf used as a tie, so as to form a head of one and a half to two inches in length. Care should be had to make the bundles as uniform in size and color as possible, as it adds to the beauty of sample by which it is to be sold. When the day's work is done, let the tobacco, neatly pressed through the hands, be put in a winrow, as it is termed, viz: laid straight in a bulk or pile of sufficient length to hold the day or two days' work, and only the width of one bundle and one-half, reversing each course so as to have the heads of the bundles out. Here it may remain until stripping season is over or the crop stripped. The first good drying spell of weather after the stripping, get the smoothest and smallest sticks upon which the tobacco was hung and hang up the tobacco to dry, carefully shaking it out when hung, so as to secure a uniform drying. When the weather again becomes moist enough to bring the tobacco in case, take it down and carefully bulk it away as before directed, only taking more care to straighten the bundles and make the bulk much wider; this is done by lapping the bundles over each course, similar to shingling a roof, the bulker having his knees upon the bulk, carefully laying down the tobacco as it is straightened and handed to him. When the bulk is finished, weigh it down heavily with logs or some heavy weight. Care must be taken that the tobacco does not imbibe too much moisture, or get too high in case before it is bulked, as it will injure. So soon as the tobacco becomes soft enough to handle without breaking, it may be put in bulk, and should the stems break a little under the pressure of the bulker's knee, no material damage will be done, provided the leaf does not crumble. A little attention will soon teach the most ignorant the proper order for safe-keeping. The tobacco will be safe in bulk, and will wait the planter's convenience to prize it in hogsheads.

In prizing, the different qualities should not be mixed; and if the planter

has been careful to keep them separated, no trouble will be had in assorting them when ready to prize. In packing in the hogsheads, care should be taken to have every bundle straight, and every leaf to its bundle. From a well packed hogshead any bundle may be drawn without injury or interruption to the others. The usual way of packing is to commence across the middle of the hogshead, placing the heads of the first course of bundles about eight or ten inches from the outer edge and running the course evenly across; the packer then places the bundles of the next course in the same direction, the heads against the side or edge of the hogshead, and follow the circumference until the heads of the two courses come in contact; after that course is completed, he finishes the other side by placing the heads against the cask as before, so as to have three courses across the cask, the bundles all laid in the same direction, and the next layer is reversed, carefully placing each bundle as it is thrown or handed to him. When filled, it is subjected to the press or screw and forced down.

Our hogsheads are from forty-four to forty-eight inches across the head, and fifty-eight inches in length, and from 1,800 to 2,000 pounds can be easily prized in them. If the tobacco is large, rich and oily, the harder it is pressed the better, and the better price it commands. These remarks are particularly applicable to those heavy descriptions of tobacco known in Virginia as heavy shipping leaf, and in the West as Clarksville tobacco, where the soil and climate are peculiarly adapted to the production of this description of tobacco. In climates not so well adapted and soil of a different character, the same variety of the weed will assume a different character, being of a finer or coarser texture, as the case may be, light and bulky, and destitute of oil and substance. Tobacco of this description should be managed as before directed, but prized lightly in the casks, so as to admit of a free and open leaf, such being mostly required for cigar leaf

The writer has been a close observer of tobacco sales for several years, and has seen a difference of two to five dollars per cwt. produced in crops grown on adjoining farms, cultivated in the same manner, and sold on the same day. The buyer must take the tobacco as it comes from the planter's hand; he can only use a certain part of it per day. That in safe condition he can keep for future use, and is always willing to pay for it full market rates; that out of condition he must keep until he can use it; and, if he considers his interest, buys at what it will be worth to him when he shall be ready to work it up, thereby throwing on the planter the injury and loss in the tobacco from the time of purchase to that of manufacturing. This loss is considerable. The planter has to bear it; it is right that he should. He has no cause to complain of the manufacturer; if he feels like doing so, let him come here in September or October, and walk into one of our large factories, and take a look at a hogshead then being pulled up, bearing his own name on its head, which he sold in the spring. We presume he would then feel rather more sympathy than blame for the manufacturer, and congratulate himself that he and that tobacco parted long ago. But planters can remedy this evil. It is useless for them to talk about bad seasons for striking, bad winds, cold winds, too much or too little rain, &c. This will not exonerate them from the duty they owe themselves. These bad seasons

are not universal; they do not affect every planter; when they do we shall believe them. There are planters who always manage their crops properly, in defiance of too much season, too little season, or any season at all. They are men of reputation as planters, and will do all they can to sustain it. Examine their crops year after year, and they will invariably be found in good condition, and will always bring the highest prices.

AUGUSTA, *February* 2, 1863.

ESSAY ON HEMP CULTURE.

BY L. J. BRADFORD, PRESIDENT OF THE KENTUCKY STATE AGRICULTURAL SOCIETY.

The culture of hemp is an interest of great and growing importance in the great West. Its production heretofore has been mainly confined to Kentucky and Missouri, but there can be no reasonable doubt in the minds of those who have given the subject the least attention, that Illinois, Iowa, Minnesota and Wisconsin have vast advantages over the two named States in its production. Many writers have advanced the idea that hemp, like cotton, could not be grown by free white labor; and that its production would, for some time at least, be confined to the slave States. Nothing can be farther from the truth. The climate the very best adapted to hemp growth, is found far north of the home of the negro, and where he would absolutely perish from the effects of climate. Hot, short, quick, forcing seasons of growth, just such as the region referred to actually possesses, are, of all, best adapted to the plant-growth of this great staple, and the day is not distant when the named States will be as noted hemp producing States as Kentucky and Missouri ever were.

It is to be regretted that in our census returns hemp and flax have been confounded; but it may, however, be safely assumed that the growth and preparation of hemp are so far below the actual consumption of the country as to assure the Iowa agriculturist of a continued good demand and paying prices for many years to come; and the experience of Kentucky and Missouri has fully proven that the production even of an inferior staple has been and is yet remunerative. The reader must bear in mind the fact that American hemp is almost exclusively what is technically called *dew rotted*, that is, spread upon the surface of the earth and there rotted by the slow process of the elements. France grows more hemp than flax for the linen manufacture and the finer grades of cordage and twines. The fiber is greatly superior to American, from the fact that her climate is of a lower temperature than that of the portion of this country that grows hemp, and the further fact that she has abundant supplies of pure soft water for steeping in the rotting process; and the same is true of the Russian production. The soil of Kentucky is as well adapted to the growth of this plant as any in Europe or America, but there her adaptedness ends; her general temperature is too high, and she is entirely destitute of water of the proper quality for the steeping process; hence all attempts to furnish our navy from this State have been failures, notwithstanding that department has

offered great inducements to her growers to water rot. Iowa has certainly a climate much colder than Kentucky, and pure soft water in her small lakes and streams without limit, and most certainly a soil equal in fertility to any on the globe. Why may not, then, her enterprising people reach forth their hands and lay hold of this prize, so well adapted to her soil, climate and situation? In the process of dew rotting, the fiber, especially in warm climates, is materially deteriorated, and in some cases so far injured as to produce a very low grade of lint, unfit for anything but the very coarsest and lowest grades of bagging. This is especially the case when exposed to the dew process in open, wet winters in Kentucky, thus proving that the true hemp latitude is north of this State. Cold, snowy winters, on the contrary, universally produce an improved quality of lint, always brighter and stronger.

CULTURE OF SEED.

The first step in hemp culture is the production of good, sound, plump seed. Land intended for seed must be in good tilth, and well prepared for planting by early corn-planting. It should be laid off in straight rows four feet apart each way, and planted in hills, seven or eight seeds to the hill. The same rules observed for cultivating corn will apply in the after culture of hemp seed. When the plants reach six or eight inches high, they should be thinned to from three to four plants. Hemp plants are divided into what the farmers call male and female, the former producing the pollen or impregnating powder, the latter bearing the seed. A very little observation will enable the growers to distinguish between them. As soon as they can be distinguished, the male should be drawn up by the root, except here and there a solitary plant left, that the female plants may be properly impregnated. The female is to be retained until its seeds are perfected, when it is to be harvested by cutting at the ground and removal to cover. When cured, detach the seed with a stout stick of convenient length, winnow and put up in barrels or sacks, perfectly dry, out of the way of rats and mice.

PREPARATION OF LAND.

The soil for hemp must be a strong, calcareous, deep, warm, loamy, perfectly dry one, deeply and thoroughly prepared by plowing and cross-plowing until a fine state of tilth is produced, more or less according to its previous condition.

PUTTING IN THE CROPS.

The ground having been faithfully prepared, the grower must hasten the operation of seeding with the utmost dispatch, as the earlier the seeding, as a rule, the heavier the lint of the plant. Mark off the land with a small plow and very shallow furrow, or it may be marked off by a drag made of a small log of wood—anything to make a line to guide the sower accurately; then proceed by hand to broadcast your seed evenly at the rate of fifty pounds of seed per acre as the *minimum*, or even up to seventy pounds as the maximum quantity, varying with the strength of the land; the object being to produce as thick a growth of plants as the land will sustain. If the plants set too thin on rich soil, the stalks grow too coarse,

producing a coarse and inferior lint; on the contrary, if seeded too thick, the growth proves so short as to materially affect the value of the crop. In the latitude of the hemp-growing section of Kentucky, the seeding is mostly done from the 1st to the 15th of April, and the land generally plowed the fall before.

In Iowa the seeding should be done as soon as the ground proves to be in good, dry, working order. Although the seed itself seems very tender and its vitality easily affected, and its germination after sowing often seriously disturbed by unfavorable circumstances, yet, when once above ground and fairly set, no ordinary frosts that destroy other vegetation seem to affect it. Hence but little danger need be apprehended from late frosts, that prove so destructive to corn. The seed being sown, proceed to cover them up with a light harrow, by running both ways to secure uniform results. The shallower the seed is covered in a moist soil the more certain the vegetation. If the season and soil be dry, a somewhat deeper covering may be necessary. Under favorable circumstances the crop makes its appearance in a few days, and with proper sun and moisture it rapidly covers the ground. From seed time until harvest the laborer has only to watch its almost magic growth from day to day. After having once covered the ground, the crop is generally considered safe by the grower, yet he is sometimes doomed to disppointment. Hail storms prove very destructive to the very tender, watery growth of the young hemp plant; high winds damage the yield, but never entirely destroy the crop from seed time until harvest.

RIPENING AND HARVESTING.

The maturity of the crop is indicated by a change of color in the leaf, it gradually fading from a deep green to a paler hue, also a shedding of the leaves, beginning at the bottom of the leaves and gradually extending up the stalk.

The male plants ripen fully ten days in advance of the female, and, in some countries, where labor is worth next to nothing, the male is harvested by being drawn up by the roots, the female being left standing; in our country such a mode of harvesting is impracticable; hence, the American grower must divide the time as near as may be between the earlier and later ripening, and thus secure the best results possible under the circumstances. The male plant is covered with very minute pods, bearing pollen, which at maturity burst and fill the whole atmosphere. It may be seen, when the crop is stirred by a brisk breeze, rising in immense clouds and floating away from the field. When this is seen, in addition to the indications previously named, the crop is ready for the knife.

This instrument is of a peculiar shape, perfected by long experience, and need not here be described, as it can be purchased in the hemp region of Kentucky of almost any smith. The ancient manner of harvesting was by pulling, as with flax, but this mode has long since been abandoned in favor of the hemp-hook, as the knife is called. Of late years J. B. McCormick, of St. Louis, Mo., and Versailles, Ky., has patented hemp-cutting machinery as an attachment to the McCormick reaper. The writer has used the attachment, and considers it a perfect success; it will supersede the hook in all level lands, and must prove well adapted to Iowa use. In

Kentucky some of her best hemp lands lie so rolling and rough as to perhaps preclude its use. If the crop is to be cut with the hook, the operator is required to cut at once through a width corresponding to the length of the hemp and as close to the ground as possible, spreading his hemp in his rear in an even, smooth swath, where it remains exposed to the sun's rays until it is properly cured and the leaves sufficiently dried to detach easily. This last operation is sometimes omitted by careless growers, and some contend without injury. The hemp can be shocked (or *stooked*, as the Yankee would say) with more compactness without the leaves than with them, and any operation having an influence upon the future security of the staple from dampness or atmospheric influence is certainly important; the perfect detachment of all the leaves should then in no wise be omitted. No time should be lost after the stalk is cured in getting the crop up and in neat shocks. Every additional day's exposure to sun, wind, rain or dew is deteriorating its quality and subtracting from its quantity; the brighter the stalks can be secured the better. The same rules will apply to hemp that obtain in securing good hay. The operator, in taking up the hemp, uses a rude stick cut from the branches of the nearest tree, about the length and weight of a heavy hickory walking cane, taking care to use a fork of the branch ( ) as delineated. With this primitive but very effective tool he can rapidly draw the stalks into bunches of the proper size for sheaves. In operating, he throws his rude hook forward its full length, and suddenly draws it towards him, each motion making a bunch; this he raises quickly from the ground, and with his hook, by a few well directed strokes, divests the plant of its leaves. He then binds his sheaf with its own stalks, and passes on to repeat the operation. Other laborers follow and place the hemp in neat, close shocks of convenient size, securing the top by a neat band made of hemp stalks themselves, after the manner of shocking corn. Here it is suffered to remain until the whole crop is thus secured. As soon thereafter as possible, selecting clear, dry weather for the operation, the whole crop is to be secured by ricking or stacking.

The same rules are to be observed in stacking as with grain, the object being to keep the crop secure and dry until the proper time for rotting arrives. In the latitude of Kentucky, about the middle of October is the proper time. The crop must be retained in the rick or stack until the summer heats and rains have passed, and frost appears instead of dew; the whole crop is then removed from the rick and rehauled back on the same ground on which it grew, there to be spread in thin swaths for rotting, where it remains without turning until properly rotted. This is indicated by the fiber freely parting from the stalk, and the dissolution, by the action of the elements, of the peculiar substance that causes it to adhere thereto. This stage is only to be learned to perfection by practical experience, yet the novice must have some information to enable him to begin to learn, and it is easily acquired by any one the least observant. When the operator finds his hemp sufficiently rotted, the wooden hook is again brought into requisition for drawing once more the swaths in convenient bunches. The hemp will have lost much of its weight, and can be bunched and shocked with less labor than at first; besides, at this last shocking, the binding is to be omitted entirely, the hemp is to be carefully and neatly

handled, all tangling to be avoided, and placed again in neat shocks and firmly bound at the top. Then comes the last and crowning operation, the breaking and dressing the fiber or lint for the market. The peculiar brake to be used, like the knife or hook for cutting, needs no description; they are manufactured in the old hemp regions at a cost of about five dollars each, and from long experience have been perfectly adapted to the uses required. The new beginner would save time and money by ordering a sample brake, from which any carpenter can manufacture as desired. The crop is broken in this climate directly from the shock in the open field, by the removal of the brake from shock to shock as fast as broken. In Iowa, owing to the severity of the climate, it would probably be necessary to remove the rotted hemp to the barn, where the labor of breaking could be more certainly performed. The coldest and clearest weather is the best for this operation; in fact, excess of dampness in the atmosphere suspends this latter altogether. The breaking process is laborious, yet more depends on the skill than the strength of the laborer.

I have endeavored to describe the whole pcocess as practiced by the best growers in Kentucky. The same mode will certainly apply to Iowa, up to the rotting process. With her advantages, steeping in soft water is entirely practicable, by which she will produce an article of water rotted hemp perhaps in no respect inferior to the highest priced Russian, which is fully double the value of American dew rotted, the only sort produced in this State. The writer is apprehensive that the seasons are too short in Minnesota, Wisconsin and Iowa for the successful growth of seed, a defect easily remedied by the purchase of seeds grown in more southern latitudes; but not a shadow of doubt exists in his mind that they can, at the very first effort, produce better hemp than any territory south. Time, he thinks, will demonstrate that Illinois, Iowa, Minnesota and Wisconsin compose the true hemp region of the American continent.

COUNTY ASSOCIATIONS.

In the midst of the struggle which is still in progress in our country, the county agricultural societies have many of them nobly responded in sustaining their associations and in holding their annual exhibitions. The reports give evidence of continued progress, and in some of them there has never been a year in which the societies have been so well sustained. Never was there a period in our history when it was so necessary for every effort to be put forth to advance the agricultural interests of our State. We are greatly gratified at the spirit which has been manifested by our intelligent farmers. While they have responded promptly to the call of their country in the hour of its peril, by sending their sons to sustain the best government ever known, they have vigorously prosecuted their work upon the farm, to enable them to meet the demands which will be made to sustain the credit of our country.

The county societies have been called upon to new and laborious work during the past year, to gather the statistics of their counties. Quite a number of the counties have responded, and their reports will be found in the Transactions. Many obstacles presented themselves in some of the counties, and the work was not attended to. It is hoped another year, should the subject again be brought before them, the obstacles will have been removed, and a united effort made to obtain the statistical returns from every agricultural county in the State. It is a work of the greatest importance to the agricultural interest, and when the subject has been brought intelligently before the farmers they very generally expressed themselves satisfied that this is a work that should not be neglected.

The report of the Cortland County Society, in addition to their general report, give an interesting account of the dedication of their new buildings, erected by the society. An address by the Hon. Henry S. Randall, LL. D., gives a history of the society, from its organization, in 1838, to the present time. Mr. Randall's review of the operations of the society, and a brief history of its early presiding officers, will be of peculiar interest to the farmers of that county. It would be well if a like record should be given, at an early day, of all our associations.

We desire to call attention to the reports from Ontario, Orange, Queens, Saratoga and Steuben, which are prepared in a manner to be most useful, not only to the farmers of their respective counties, but to farmers everywhere. These reports are prepared so as to carry out to a good degree the objects for which our societies were instituted. If all our societies, or even a majority of them, would take a like interest in preparing their reports, they might be embodied and published together, and their distribution among farmers generally could not fail of doing much for the advancement of agriculture in our State. We would urge upon the officers of our societies to give attention to this subject the ensuing year, and let all our reports be of such a character as to advance the agricultural interest and elevate the profession.

ALLEGANY.

Owing to the absence of the secretary of the society as volunteer surgeon in the army of the Union, a brief report only can be made. The exhibition of the society was a perfect success. The increased interest in the growing of wool has produced a spirited competition in sheep. The exhibition of stock was even better than former years. The second and last day of the fair was devoted to the exhibition of horses, of which there were ninety-three entries, and the display was a very attractive one. The dairy competition was good. Vegetables very fine. The ladies' department was as attractive as ever, and added, as it always does, much to the interest of the exhibition.

The officers for 1863 are: W. H. King, President; E. M. Alba, Secretary; James Lockhart, Treasurer.

BROOME.

BINGHAMTON, *November* 1, 1862.

The fifth annual fair of the Broome County Agricultural Society was held at Binghamton, on the 9th, 10th, 11th and 12th days of September, 1862.

The attendance, owing to the disturbed state of the nation and the absence of many of our farmers and their sons, who are engaged in the service of their country, was less than at the fair of the previous year, but still the result much exceeded our expectations.

The receipts of our society during the present year amount to.....	$2,807 87
The amount paid for premiums and other expenses, including rent of fair ground.....	2,299 70
Leaving a balance of.....	$7 67

The annual address was delivered by Thomas D. Wright, Esq., of Binghamton, and was received with great attention and satisfaction by the large audience who listened to its delivery.

The display of horses and cattle was deemed fully equal to any former year. The exhibition of sheep was much better than usual. The interest of the farming community in this county in the breed and quality of sheep is constantly increasing.

The display of fruits, garden vegetables, and domestic manufactures was not equal to some of our previous fairs.

The farm products of the county for the past year have been quite as good as usual. The amount of butter made in this county the present year largely exceeds any previous year.

Our society is now in a prosperous and healthy condition; entirely free from debt; and we have faith to believe that the future reports of the society will show increasing prosperity.

E. D. ROBINSON, *Secretary.*

CAYUGA

The twenty-second annual exhibition of the Cayuga County Agricultural and Horticultural Society was held on the grounds of the society, September 24th, 25th, 26th, and 27th.

A severe rain storm occurring on the first day, rather dampened the ardor of exhibitors, and put a lugubrious look upon the usually radiant face of our treasurer. Before night, however, skies brightened and so did faces. As a whole, the success of this fair has never been equaled in the county. The display in all departments was large, and in some of them unprecedentedly so. In the class of horses the greatest number of entries was made, and to that class the attention of visitors was most largely drawn. The steady improvement in stock of this class throughout the State is nowhere more observable than in this county. In the class of cattle there was a fine representation, both as to number and breed. Sheep, swine, and poultry were also well represented, and claimed their share of attention. In Exhibition Hall, where were displayed vegetables, fruit, flowers, and fancy articles, the show was never excelled. A perfect throng of people filled the spacious building throughout the entire exhibition. In the implement department some of the old "stand-bys," and also many new labor-saving inventions were shown. The interest felt in this department was attested by the crowds that occupied the space allotted to them. Financially, the exhibition was a perfect success.

The society, through its board of managers, is now making strenuous efforts to clear itself from debt. Its prospects to this end are full of promise. Several of the leading business men of Auburn, and well-to-do farmers of the county, have subscribed liberally to this object.

Officers 1863: H. W. Dwight, President; S. Edwards Todd, Secretary; J. C. Mann, Treasurer. JOHN G. HOSMER, *Secretary.*

CATTARAUGUS.

The twenty-first annual fair of this society was held on the spacious grounds of the "Olean Fair Ground Association," in the village of Olean, on the 23d, 24th and 25th days of September last.

The fairs of the society have, for the last eight years, been held in the village of Little Valley; but the officers of the society, feeling conscious that the interest of agriculture in the county would be best served, and the success of the fairs increased by changing the location, decided to try the experiment, and accordingly accepted the generous invitation of the citizens of Olean to hold the fair at that place.

The change of location proved a decided success. The entries of stock were unusually large, and the exhibition of horses the best ever held in the county, varying from the heavy draught horse to the 2 minute 40 second roadster.

There were some fine thorough-bred Devons and Durhams on the ground, owned by S. R. Seely and Isaac Reed, of this county. The show of sheep was very fine, consisting of Spanish Merinos, French Merinos, Leicestershire, &c., &c. The fruit raised and exhibited from this county was of a very fine quality.

Elwanger & Barry, of the Mount Hope nurseries, Rochester, N. Y., exhibited thirty-four kinds of pears, that attracted much attention, and which were superior to anything of the kind ever before exhibited in the county.

The show in the ladies' department was very fine, and attracted much

attention. Many of the articles on exhibition showed skill and workmanship highly creditable to the ladies of our county.

The weather the first day of the fair was very fine, though some dusty. The second day opened very discouragingly, and the rain fell profusely, but before noon the sky was clear. The weather the last day of the fair was fine; and the sale of *single admission tickets* exceeded that of any former fair of the society.

Those who have watched the progress of agriculture in this county for the past few years, in connection with this society, cannot question its influence for good. We now have cattle, horses, sheep, swine and poultry of the most approved breeds.

The annual address was delivered, at 2 o'clock, P. M., the last day, by Hon. George W. Clinton of Buffalo. His address was able and practical, and was listened to with marked attention by the farmers of our county.

The trial of speed of trotting horses took place immediately after the address. Joseph Simpier, of Olean, was awarded the prizes for the best time, one and two miles.

So far as financial matters are concerned, the society stands well, and promises much usefulness to the people of the county.

The receipts into the treasury, from all sources, during the year was $1,202.82. For tickets at the fair, $689.95; expenditures, $1.013.01; leaving a balance in the treasury on the 31st December, 1862, of $189.81.

The annual meeting of the society was held at Little Valley, on the 3d day of January last, and the following persons were elected officers of the society for 1863: President, Samuel Wm. Johnson, Ellicottville; Vice-President, Lorenzo Stratton, Little Valley; Secretary, Horace S. Huntley, Little Valley; Treasurer, Claudius V. B. Barse, Olean; and six directors.

H. S. HUNTLEY, *Secretary.*

February, 1863.

CHAUTAUQUA.

The Chautauqua Agricultural Society held its twenty-sixth annual cattle show and fair, at the fair grounds in Panama, on the 10th, 11th and 12th of September.

On the first day the society was called to order by the president. The treasurer made his report of the receipts and expenditures of the society, which, on motion of L. B. Sessions, was accepted.

Panama was selected as the place for holding the next annual fair of the society.

The society then proceeded to the election of officers for the ensuing year. Darius Knapp, of Panama, was elected President; F. D. Ormes, Secretary; F. G. Stewart, Treasurer, and a vice-president for each town in the county.

On the second day of the exhibition matched and farm horses were exhibited, and the show was creditable and the contest spirited.

The display of single horses followed, and the exhibition in this class was very good, and numbers quite extensive.

On the third day the exhibition of stallions took place at nine o'clock. There were a number of entries, and the show was very creditable to the county.

At eleven o'clock the annual address was delivered by Hon. Madison Brunell, and was listened to with great interest.

A trial of speed of horses followed, and created considerable excitement.

The excitement in regard to the national struggle diminished largely the attendance during the exhibition, and this, with very unfavorable weather, so diminished the receipts as to prevent payments of the premiums in full.

F. D. ORMES, *Secretary.*

CHENANGO.

The annual fair of the Chenango County Agricultural Society was held at Norwich on the 24th, 25th and 26th days of September, 1862. The exhibition was very good, and in some respects better than usual. The first day was devoted to making entries. The second day the articles on exhibition were examined by the several committees, &c. The third day, to trying the speed of the trotting horses, an address, and report of the committee.

The exhibition of cattle was fine, especially the Durhams, which would have been an ornament to any exhibition of blooded stock, consisting of thorough-breds, grades, natives, fat cattle, oxen, dairy cattle, etc.

The horse show was very creditable to the farmers and stock raisers of the county. The trotting was spirited and exciting. The display of sheep was better than for many years, and of all grades and kinds of long, middling and fine wools. The display of swine was large, and the quality fine. A large variety of fruit was on exhibition, and the samples of each were good, and reflected an increasing interest in fruit growing throughout the county.

The exhibition of dairy products was very meager indeed, but the little was of the first quality.

The show of mechanical articles was not large, but many articles were of superior workmanship, which spoke well for the mechanics of Chenango.

Floral hall was well filled and tastefully decorated and arranged by the ladies. The display of domestic manufactures, ornamental work, fancy articles, fine arts, cookery, etc., reflected much credit on the ladies, who have always done so much to make our fairs interesting.

A very able address was delivered by the Rev. A. N. Benedict, of Norwich, and listened to by a very large audience with marked attention and interest, and at its close was highly complimented.

On the whole, our fair was a decided success. Considering the almost total want of interest in agricultural fairs, in consequence of the excitement of the times, the raising of volunteers for the war, the scarcity of change, the scarcity of laborers to gather the harvest, caused by the withdrawing from the laborers of the county over 1,000 men, etc., which would naturally diminish the attendance, and consequently the receipts of the society, and the general impression that the fair would be a failure, the friends of the society have reason to congratulate themselves on the result.

The fairs for the last four years were held in a rain storm, and in consequence of the diminished receipts the society has been running in debt at the rate of about $100 per year. This year our receipts have exceeded our expenditures by over $100.

The annual meeting was at Norwich, January 6, 1863. The President, L. C. Sweet, Esq., in the chair. Report of the treasurer presented and approved.

The following officers were elected for 1863: President, Asa Pellet, Plymouth; Secretary, John A. Randall, Norwich; Treasurer, Dr. Blin Harris, Norwich.

Receipts, $951.20; expenditures, $813.05; balance $138.15.

J. A. RANDALL, *Secretary.*

CLINTON.

The last annual fair of the Clinton County Agricultural Society was neld in the year 1860.

The unhappy state of our country, owing to the unnatural and wicked rebellion, inaugurated in the year 1860 and '61, for the overthrow of the most prosperous and happy government in the world, roused the spirit of patriotism throughout the length and breadth of the Northern States; and the citizens of old Clinton, fired by the love of country, sent forth her sons from their various employments, without stint, and contributed liberally, both of time and means, to aid in preserving, if possible, the constitution and the laws, and to restore to our beloved country its wonted inestimable condition of peace and prosperity. To this cause our citizens seemed to direct all the energy and time which could be spared from their necessary avocations. Observing the public mind to be so much exercised in national affairs, our society deemed it advisable, and for the best interest of the county, to omit holding the annual agricultural exhibition for the years 1861 and 1862.

We are doing what we can to obtain the agricultural statistics from the several school districts in this county, in compliance with the act passed by the Legislature of last year. We want to present as full and accurate a statement as we can with the means appropriated for that purpose, and in order to enable us to do so we shall be obliged to defer making our returns some time beyond the period named in the act.

The long continued drought, which commenced about planting time in the summer of 1862, seriously injured the crops in some portions of the county, and the yield of grain, potatoes and hay will fall short of the usual average yield for years past.

The return of the treasurer of this society will accompany this report.

The officers elected by the society in 1861 are holding over. On the 31st instant will be held the annual election of officers to serve the ensuing year.

F. L. C. SAILLY, *President.*

COLUMBIA.

This society held its annual fair in October, on its own grounds, near the village of Chatham Four Corners. The fair opened on the 1st day of the month, but it was so rainy that the entries were not large, and the visitors still less. Finding the exhibition was likely to prove an entire failure, on account of the storm, it was resolved to call the second day of the

month the first day of the fair, which proved to be but little better, the storm still continuing; yet the exhibitors of cattle and sheep were in attendance with their stock. The receipts from visitors, which is the principal source of income, was so small as to forbid the payment of the premiums offered, unless money could be obtained in some other way. At noon, a meeting of the principal exhibitors was called in the business office, a statement made to them of the condition of the society, in relation to funds, by its officers, who also inquired of them what should be done. On motion, it was unanimously resolved to go on, make the exhibition, award the premiums, and they would be content with the credit of having the first, second, or third best, as the case might be, and not receive the money premiums. This liberality of exhibitors, in donating to the society all the premiums awarded to them, put the financial standing of the society such as to allow the finance committee to report quite as favorably as for several previous years.

CATTLE.—The exhibition was excellent—never better—either in pure bloods, grades, or natives. To speak of all worthy of special mention would extend this beyond reasonable limits, I will therefore be content by giving the names of a few of the successful breeders who had stock on exhibition: Peter F. Mesick and Chatles A. Vandeusen, of Ghent; Winthrop Phelps and Wm. D. Steward, of Chatham; John Harman, of Canaan; Jared Pratt, of Austerlitz. James Van Alstyne, of Ghent, a distinguished feeder, exhibited some splendid fat cattle.

SHEEP.—Daniel S. Curtis, of Canaan, and Wm. P. Clark, of Austerlitz, were given the premiums on fine wool sheep. Daniel Haywood, of Hillsdale, had a beautiful trio of pure-blood Southdowns and Cotswold. Thomas C. Rider, of Chatham, had a very fine pen of Southdowns.

HORSES.—The exhibition was good, and quite too numerous to speak of all that had fine points. Chauncy H. King, of Chatham, exhibited a sucking colt by George M. Patchen (said to much resemble the sire), for which $300 was refused. R. W. Macy, of Ghent, exhibited a stallion colt, three years old, by Ethan Allen, which has both beauty and speed. On account of the storm and a heavy track, the trial of speed did not attract the attention it otherwise would. This county is, however, somewhat distinguished for its fast nags.

FRUIT AND FLOWERS.—Stephen G. Bushnell, of Ghent, had the largest variety of apples, pears, and grapes. S. B. Noble had also a very fine lot. John Wesley Jones, of Chatham Four Corners, eclipsed all others combined in variety of flowers, some very rare ones from imported seed.

FANCY ARTICLES.—The exhibition was good, but not large, in consequence of the foul weather, which continued during the whole fair. For the same reason there was no plowing match, as advertised.

There were no farms or crops entered for premiums.

The officers of the society for 1863 are: Peter F. Mesick, President; Samuel A. Curtis, Vice-President; E. Backus, Secretary; James T. Shufelt, Treasurer.

E. BACKUS, *Secretary.*

CHATHAM FOUR CORNERS, *January* 31.

CORTLAND.

In giving a report of the proceedings of the Cortland County Agricultural Society, for the year 1862, allow me to refer to a few of the incidents attendant with the grounds and annual festivals of said society.

Since the permanent location of our grounds, in 1858, the society has held an annual fair in June, exclusively for the show of horses and sale of stock and farm implements, the premium lists usually amounting to some five hundred dollars on horses. These shows or exhibitions have at all times been under the control of the society, have been well attended, and thus far have created a new stimulus among the breeders and owners of horses; and furthermore, these exhibitions have always proved a financial success for the society, and with few exceptions have given general satisfaction to the citizens of our county.

The exhibition for 1862 commenced June 16th, was well attended, many entries were made, and a fine show closed up the first day. The second day opened with a severe rain which lasted nearly all day. Yet there were many visitors from our own and the adjoining counties, to witness the trial of speed and action of a trot which took place near sundown, with general satisfaction both to visitors and competitors.

The society have, the past year, erected a fine and substantial row of seating under cover, in front of the judges' stand, some forty feet outside of the track, for the accommodation of several hundred persons, who have a commanding view, from every seat, of the whole track, to witness the various display and show of horses and teams upon the track, which, by the by, is one of the most perfect ones in the State. The society have also, during the past year, built a large and spacious building designed for an agricultural and floral hall.

The building is permanent, and well arranged for the general exhibition of wares and products, including those from the farmer, the mechanic, the tradesman and artist, and not excepting the many both useful and ornamental articles usually presented by the ladies of our county, and which have always proved among the chief attractions at our fairs.

The building is erected in front of the half mile track, and some ten rods back from the front entrance to the grounds. It is one hundred and sixty-eight feet in length, with a wing in front at each end, sixty feet in length. The main building and wings have twenty feet posts, making an upper and lower room, each thirty feet wide by two hundred and eighty-eight feet in length. In the center of the main building is a gallery open from the lower floor to the roof, designed for a floral hall, and can be viewed from both upper and lower floors. It is eighteen feet wide by thirty-six in length, inclosed by railing, with a six foot passage on each side, on both floors. The lower room of one wing, thirty by sixty feet, was very well adapted and used for a dining hall during the three days of our annual fair, held the 24th, 25th and 26th days of September.

The first day of the fair, Tuesday, was mostly devoted to the dedication of the new buildings to the cause of agriculture, science and the arts, together with a farmers' festival and public dinner, which was admirably well served up, to the great satisfaction of a numerous and waiting audience. After dinner, and while seated at the tables, the ceremonies attend-

ing the dedication of the building were opened by prayer from Rev. Mr. Hoag, of Cortland. After prayer, the Hon. H. S. Randall, LL.D., being called upon, gave a very brief, yet minute history of the Cortland County Agricultural Society from its very infancy to the present time, which appeared to be just the thing for the occasion, and was listened to with marked attention. Rev. Mr. Bigelow, of Homer, was next called for. After making some very appropriate remarks in reference to the cause of agriculture in his usual happy style, he proceeded with the ceremony of dedicating the building to and for the purposes above specified, in a manner that did credit to himself, and highly befitting the occasion. Rev. Mr. Percival, of Homer, was also called for, who spoke highly of the prospects of the farmers and members of our society, and of the interest that had called so many together, and of the propriety of the ceremonies that had thus far taken place.

Rev. Mr. Seymour, of Cortland, was next called for, who spoke at some length of the noble calling that our society was engaged in, and of the high calling of those that had ever sustained the organization; and to sustain his position for the high and noble cause that the farmer was toiling in, made numerous references to ancient history, and also to the Bible, where that book placed the tillers of the soil, in the different ages, among the first men of the various nations of the earth. The exercises of the day were concluded by prayer from Rev. Mr. Purrington, of Tompkins county.

The second day opened upon us with a drenching rain that lasted until nearly noon, and prevented many from attending as visitors and competitors. Yet, notwithstanding the unpleasantness of the day, there was quite a large gathering of people, with a fair show of stock in the several departments, and making the entries nearly equal to previous years. While the mechanical department was fairly represented, the show of vegetables was an average with former years. Floral hall was well filled and tastefully trimmed, and the show of needle and fancy work, together with paintings, etc., made the exhibition fully equal to any preceding fair.

The third day was devoted exclusively to the show of horses and mules, awarding of premiums, etc. On the whole, the fair passed off very quietly, and to the general satisfaction of both visitors and competitors, and proved a success for the society on the financial side of the question; and there is a decided feeling that the agricultural society must be sustained, with an evidently increasing interest with our farmers for improvements in various ways, as regards the different branches of agriculture.

The annual meeting of the Cortland County Agricultural Society was held at the court house on the 20th day of January, 1863, pursuant to notice. The meeting was called to order by S. D. Freer, President. The reports of the committee on field and grain crops being called for, the following premiums were awarded:

For the best crop of turnips, to Cuthbert Fisher, Cortland—360 bushels on two-thirds of an acre.

For the best crop of potatoes, to Henry McKevitt, Truxton—240 bushels on 198 rods of ground.

For the best crop of carrots, to Cuthbert Fisher, Cortland—60 bushels on one-eighth of an acre.

For the best crop of barley, to Cuthbert Fisher, Cortland—51 bushels on one and a half acres of land.

The annexed accounts of the treasurer were read and referred to the following auditing committee: Jedediah Barber, Henry Stephens and James A. Sherman, who reported them correct, and were adopted by the meeting.

At the last annual meeting in January the balance in the treasury was $1,341, then on loans. An estimate was made of amounts due the society, and belonging to that year (1861), showing an available surplus for the year 1862 of $1,805. The estimate was realized, viz:

From interest received on money loaned	$108 25
From United States for rents	309 00
From State Treasurer	75 00
From old balance	1,841 00
	$1,819 25
Payments made	19 94
Leaving the balance of	$1,789 81

The receipts for the year 1862 were:

Horse exhibition in June	$872 10
Annual exhibition in September	620 22
Interest on loans	60 84
Returned premiums	25 00
Returned taxes paid in 1858, '59	13 10
Hay sold on fair grounds	25 00
Lumber sold	74 60
Fifty life members	500 00
Due from State appropriation, 1862	75 00
Making a total receipt of	$3,555 17

The payments for the year were:

Premiums and expenses of June exhibition	$327 44
Premiums and expenses of September exhibition	316 00
Premiums due for September premiums	80 00
Paid on land debt and interest	345 00
Paid on buildings	2,291 17
Amount unpaid and due on buildings	263 50
	$3,623 11

The cost of buildings, repairs, &c., for the year is $2,554.67, which is divided thus:

Preparing grounds, fences, &c., for June fair	$89 00
Lumber, labor, &c., for "stand"	175 00
Preparing grounds, fences, &c., for September fair	30 00
Extra lumber and labor for dining room and kitchen	20 00
Taking down old buildings	25 00
Cost of Exhibition Hall	2,200 60
Cost of entrance offices	75 00
	$2,255 50

The estimate made by the building committee of the probable cost of the exhibition hall was $2,200. During its erection several alterations and improvements were made upon the original plan, adding to its cost over $100. But it will be seen that it has come within the original estimate. It could not again be built for $2,500.

A series of resolutions were offered by the Hon. Henry S. Randall, adopted, and ordered to be published among the proceedings of this meeting.

Resolved, That the Cortland County Agricultural Society finds abundant cause for congratulation in the fact that during a year marked by the extraordinary circumstances of the last, it has been enabled, from its funds on hand and current receipts, to pay its annual premiums, to meet its other ordinary expenses, to defray the entire cost of its new buildings (to wit: $2,554.67), and to make the annual payment of principal and interest on its land debt ($345), so that after meeting some small payment for which there are funds on hand, not a dollar will be *due* from the society, and its only outstanding debt, hereafter to become due, will be about $800, a part of the purchase money of its land, which is payable in annual payments for several years to come.

Resolved, That with assets which represent about $6,700 in cost, and scarcely less in market value, and with liabilities extending only to the sum above named, there has been no previous period when the unincumbered resources of the society have been so large, or its pecuniary affairs in so favorable a condition to insure a vigorous prosecution of its objects in future.

Resolved, That our grounds, buildings and other structures are not probably surpassed by those of any other county society in the State; that we especially commend the enterprise and energy of our executive board, in erecting during the past year fair buildings so spacious and convenient; that, in our judgment, they were constructed with economy; and that they well meet, and no more than meet, the proper requirements of this society.

Resolved, That while we sincerely tender our thanks to all the officers of the society, we feel that they are in a special manner due to its president, Stephen D. Freer, for the constant and free bestowal of his time in directing and supervising the erection of the new buildings, a circumstance to which the buildings owe much of their excellence of material and construction. That the thanks of the society are also particularly due to the treasurer, Morgan L. Webb, for his prudent and successful management of the funds for the past fifteen years, and for the ability he has displayed during the last year, as well as on previous occasions, in raising extraordinary sums to meet extraordinary exigencies, by appealing to the liberality of our people.

On motion, the thanks of this society were voted to Francis H. Hibbard, for a returned premium to the treasurer, of fifteen dollars—the sum awarded to him at the last exhibition for the five best head of cattle. Also, to Allen B. Smith, for the return of ten dollars, awarded for premiums on jacks and mules.

Officers for 1863: Stephen D. Freer, President; A. D. Blodget, Secretary; Morgan L. Webb, Treasurer.

STEPHEN D. FREER, *President.*

HAMILTON PUTNAM, *Secretary.*

ADDRESS OF HON. HENRY S. RANDALL, LL. D., DELIVERED BEFORE THE CORTLAND COUNTY AGRICULTURAL SOCIETY, ON THE DEDICATION OF THE NEW BUILDINGS, SEPTEMBER 23, 1862.

Gentlemen of the Executive Board:

I am very sensible of the honor done me by the request of the county agricultural society, that I furnish a copy of my remarks, made at the dedica-

tion of its new buildings, for publication. I have finally, at the personal solicitation of some of the founders of the society, acceded to that request, so far as to send you the historical portion of those remarks, though I must confess I do so with the greatest reluctance. This reluctance springs from no selfish unwillingness to appear before my fellow citizens in even so slight and immature a production, but because I have feared that, if thus perpetuated, it might be allowed to take the place of a fuller and worthier memoir of the society and of its deceased worthies. Such a memoir, prepared by a graceful and genial pen, would form a most agreeable contribution to local history—would preserve memories of facts, and incidents and characters, which the posterity of the early members of this society would treasure with pride and satisfaction, after the monumental marble of their forefathers has crumbled, or only transmits names which, without such a history, would be forgotten. My own present sketch is but the fragment of a skeleton—wholly lacking completeness, and lacking the filling up of flesh and blood. The historical portion of it is mostly confined to a statement of a few financial results, without their causes or accompaniments. Its brief mentions of the dead do not extend beyond your presidents, while many other officers and members are equally entitled to remembrance. In short, it is scarcely an apology for that memoir of the society which I trust that you, gentlemen, or your successors, will cause to be published, before the recollections of cotemporaries are lost in the grave.

I am, very truly yours,

HENRY S. RANDALL.

THE ADDRESS.

Mr. President, Ladies and Gentlemen—The present important epoch in the affairs of this society has been thought a fit occasion, by its officers, to present to its present members a brief history of its organization and earlier career. They have accordingly invited me, as one of its few surviving founders, to prepare and read such a paper. Had I had time to collect and arrange the proper materials, it is a duty I should have discharged with pleasure. It is interesting to trace the oak back to the acorn. It is a grateful, though melancholy, duty to commemorate the good deeds of our fathers, and drop a tear over their urn.

But I regret to say that I have not had any opportunity to do justice to the theme. The invitation of the officers came to me so late (because, I suppose, the idea of having such a memoir prepared occurred to them so late), and I have been so constantly occupied with my public duties, that I have not had time even to examine the records of the society for its leading statistical facts. For such an examination I am indebted to its present president and treasurer; and I have arranged these facts, and interspersed them with a few of my own personal recollections of men and things.

The Cortland County Agricultural Society was organized on the 1st day of October, 1838. I remember the occasion well. After a suitable public notice, a number of gentlemen assembled at the court house in this village. William Berry, of Homer, was called to the chair, and Henry S. Randall, of Cortland, appointed secretary. The first was a dignified middle-aged

man—the last a young lawyer and editor, brimful of zeal, with a little book knowledge, and of course a much better understanding of farming, in his own opinion, than he possessed twenty years afterwards. I suppose that a good many of you, my hearers, have gone back in the same way since the days of your youth!

At that meeting there were Barbers, Berrys, Blashfields, Goodels, Hitchkocks, Hebarts, Hubbards, Houghtons, Iveses, Jewetts, Keeps, Sanderses, Whites, and others doubtless whom I do not recollect, from Homer. From Cortland, we had Ballards, Bartlits, Boises, Chamberlains, Cravaths, Eelses, Elders, Freese, Hibbards, Hopkinses, Kinnies, McGraws, Millens, Randalls, Sanderses, Shermans, and Stephenses. I believe the other towns were represented by Joseph Reynolds, of Virgil, C. P. Jacobs, of Preble, and Cephas Comstock, of Marathon.

A constitution was adopted on the spot, and Wm. Berry, C. P. Jacobs, and Henry S. Randall were appointed a committee to prepare by-laws.

A board of officers was then chosen, and, as it was the first one, I will give it entire:

William Berry, President; Jesse Ives and Cephas Comstock, Vice-Presidents; C. P. Jacobs, Secretary; Henry S. Randall, Cor. Secretary; Rufus Boies, Treasurer; Paris Barber, Joseph Reynolds, Charles McKnight, Israel Boies, Morris Miller, and Chester H. Harris, executive committee.

The board met in January, and made arrangements for a fair in Cortland village on the first Wednesday of September. The result is thus stated on the records of the society:

"The fair was very numerously attended, by both citizens and strangers; the show of stock was much better than was anticipated; dinner was prepared by R. N. Scouten, at the Eagle, in good style," &c., &c.

The disbursements in premiums that year were large—no less, my friends, than $53! The whole receipts of the year were $128; its disbursements $84. But remember, we had no legislative bounty in those days—no entrance fees to the grounds—and, if the truth must be told, but few members. Agricultural societies had not then become fashionable.

Judge William Berry, our first President, was then in the prime of life. He subsequently moved to, and died in Michigan. He was a man of intelligence, solid judgment and spotless integrity. His appearance was prepossessing, his manners calm and dignified. He discharged his duties as president efficiently and satisfactorily; smoothing local jealousies and other difficulties in the way of our starting, by his urbanity, discretion and honest impartiality.

Hereafter, I have space but to mention our presidents. John Miller, of Truxton, was elected in 1840. The receipts of this year were $65; the expenditures $75.

Among the pioneers of Cortland county, no one holds a more conspicuous place than Dr. John Miller. He was a man of marked natural abilities. His professional education was excellent; and he had been more comprehensively educated in the school of men and events. He possessed prompt decision and vehement energy of character. You all remember the tall, spare, stately figure; the dark, striking face; the frank, rapid, and, at times, impetuous address; the words that could not wait for each other,

but which poured on you like a torrent when strong feeling or an important subject invoked their utterance. He was a large and successful farmer; he held many of the most important offices within the gift of the people; and he recently died full of years and full of honor.

The next president, elected in 1841, was Jesse Ives, of Homer. The society this year touched bottom; its receipts being but $37, its disbursements $104. But this was not the fault of the president. The first zeal of the organization had begun to evaporate, at least in the bosoms of some, and the State did not, until the succeeding year, extend its helping hand.

Deacon Ives, like his predecessors, has gone down to the grave. He was as unequivocal a specimen of a truly good man as it was ever my fortune to know. The portrait has all the lineaments of the christian, without any of those of the pharisee. Firm in his own opinions, he possessed a benignity and toleration towards others, which shone forth in every act of his life. He had the happy gift of making rigid views and practices of religion and duty, attractive to others; to the young as well as the old. I never knew but one other *Deacon* (and that was good old Prosper Cravath) to whom my youthful attachments flowed out so spontaneously and warmly. He was a thorough farmer and efficient officer. He represented this county in the Legislature, and held various other civil and church offices. Peace to his honored ashes.

Dann Hibbard, of Cortlandville, became president in 1842 The State now began paying the county agricultural society $75 a year. The receipts accordingly, rose to $128. The disbursements were $125.

Mr. Hibbard was an honored citizen, and held various public trusts. He was essentially a first-class farmer His crops of grain, beef, pork, butter, etc., were always the very best, and commanded the very best prices. He kept up with the improvements of his day, but made no visionary experiments or investments. Who has forgotten him, the Quaker hat and brown coat, the shrewd penetrating eye, the ready joke, the keen and sometimes caustic repartee? "Uncle Dan" was always as "busy as a bee;" he sometimes *stung* like a bee, when a drone, a booby or a wind-bag got in his way! But the old Quaker's heart beat warmly underneath! He had a tear for affliction, an open hand for want. No man gave more liberally; few so unostentatiously. He was well read, widely informed, and possessed a clear, vigorous understanding. He died in 1857.

William Randall, of Cortlandville, succeeded Mr. Hibbard in 1843. The receipts of the year were $115; the disbursements $137.

William Randall was bred a farmer, and subsequently became a merchant and banker. It is not too much to say that he succeeded in all three avocations. He was a man of swift, sure judgment, and had, I believe, a natural grasp of understanding which would have rendered him a strong man in any avocation to which he had been educated. Like Hibbard, he was an improver, but "hastened slowly" in all *new* paths. But he was bold in decision, enterprising in action, and highly public spirited. His farms, his farm buildings, his stock, his implements and his modes of culture were always models for his neighbors.

Jedediah Barber, of Homer, was elected president in 1844. The receipts of the year were $187; the disbursements $140. Mr. Barber is a debt-payer!

The society, in some way or other, I have not had time to look up the facts, owed $21. So, on motion of Rufus Boies, a special meeting was called in April, and the amount of the debt defrayed by a subscription among the members! And then, I suppose, the patriarchs of the society went home greatly relieved in their feelings. Ah, my friends, those were the good old-fashioned debt-paying days!

I have spoken without hesitation of the dead. Shall I deny myself and yourselves the pleasure of mentioning one of the living? Mr. Barber is yet hale and vigorous among us, in that mellow autumn of life which is "frosty but kindly." Like his predecessor, he is a farmer, merchant and banker, and successful in all. Sagacious in business, energetic in execution, liberal and public spirited, long may he be spared to the fertile town and beautiful village for which he has done so much. When his grey head is laid in the dust, the schools, the churches and the public institutions of Homer will sorely miss him.

Rufus Boies, of Cortlandville, was the next president, and was elected in 1845. The receipts of the year were $185; the disbursements $173.

Captain Boies we are compelled to enumerate, also, among our dead presidents. He was an excellent farmer, and probably he and his family have done as much, if not more, than any other equal number of persons, to introduce valuable stock of various kinds into this county. Capt. Boies was a cautious, sensible man, decorous in his daily walk and deportment, both God-ward and man-ward. His quiet way of effecting his objects obscured, at least to unobserving eyes, the merits of his labors and the amount of his successes. His life was the placid stream instead of the roaring torrent; but the stream often flows on through the summer drought, fertilizing its shores and turning the wheels of useful manufactures, when the torrent is dried up. All the institutions of religion, learning and benevolence, which grew up about him, could bear witness to the efficacy of his ceaseless efforts in their behalf, and this society never had a steadier and more useful friend.

Henry S. Randall, of Cortlandville, became president in 1846. The receipts of the year were $160; the disbursements $128.

With Mr. Randall commenced what may be termed the younger generation, or "second crop" of presidents. His successors, with one or two exceptions, belong to the active business class of the present day. All of them but one, the lamented Walrod, are yet alive; and all of them but two, Messrs. Rice and Leach, are residents of the county. Under these circumstances it would not be seemly to comment on them as I have commented on their predecessors. When the next wave breaks on the shore of death, but just ahead of us, this generation, too, will have passed away. Then let their epitaphs be impartially spoken by some one who shall be called on to address this society.

A mere string of names and figures will be but a dry nothing; but endure it patiently for a few moments while I bring down the official and financial record to the present day.

Amos Rice was president in 1847. Receipts, $168; disbursements, $168.

Jas. S. Leach was president in 1848. Receipts, $210; disbursements, $172.

Peter Walrod was president in 1840. Receipts, $296; disbursements, $214.

Hiram Hopkins was president in 1850. Receipts, $260; disbursements, $207.

Noah Hitchcock, Jr., was president in 1851. Receipts, $311; disbursements, $263.

Anthony Freer was president in 1852. Receipts $445; disbursements, $571.

Paris Barber was president in 1853. Receipts, $574; disbursements, $482.

Francis H. Hibbard was president in 1854. Receipts $670; disbursements, $779.

George J. J. Barber was president in 1855. Receipts, $1,455; disbursements, $1,029.

Israel Boies was president in 1856. Receipts, $1,305; disbursements, $762.

Alfred L. Chamberlain was president in 1857. Receipts, $1,082; disbursements, $1,007.

Stephen D. Freer was president in 1858. Receipts, $2,721; disbursements, $2,658.

Manley Hobart was president in 1859. Receipts, $1,678; disbursements, $1,586.

William P. Randall was president in 1860. Receipts, $1,938; disbursements, $1,588.

William E. Tallman was president in 1861. Receipts, $1,010; disbursements, $938.

The present spacious and admirable grounds of the society were purchased in 1858, at a cost of $2,300. About $1,000 of this remains unpaid. The expenditures for fencing, building, repairs, etc., previous to the present year, have been about $1,400, all of which is paid.

The new buildings erected the present year will cost about $2,500.

The society has funds now invested amounting, with the addition of recent contributions, to about $2,300. It will thus be seen that these spacious and convenient structures will scarcely increase the previous indebtedness of the society, and that if success crowns the present fair, that indebtedness will be materially diminished. One more fair ought to wipe it out altogether.

CORTLAND VILLAGE, *Sept.* 27, 1862.

DELAWARE.

The fair in this county was held on the 17th, 18th and 19th of September at Franklin. There was a large exhibition of stock, consisting of Durham, Devon, Ayrshire and natives, the Durham predominating. The farmers of Delaware have generally mixed with the Durham for some years past, which has brought to our fair a large quantity of grade-Durhams, and much of it is of a superior quality, being fine in symmetry and appearance, good for milk and butter, of good weight for beef, and take flesh freely. There are a number of farmers that have a splendid stock of Devons and grades, but it is generally thought they are not quite as good as the native and grade-Durham for butter and milk. Dairying being the principal busi-

ness of the county, the farmers are cautious in running out their native stock.

There was a good show of sheep, quite large in proportion to other years.

The exhibition of swine, poultry and mechanical instruments was creditable for the county.

The ladies' show of paintings, embroidery, &c., including all kinds of handiwork, was of excellent kind and quality, but not so large as on former occasions, their attention and patriotism being engaged in preparing lint, bandages, under shirts, &c., &c., for our sick and wounded soldiers. A noble work, indeed!

The show of stallions was superior to any former year, both in numbers and quality. The exhibition of teams, brood mares, colts and single horses was creditable to the county.

The result, in a financial point of view, was not very favorable. The exciting scenes of the preparation of the 144th regiment to leave the county for the seat of war drew the attention of many to the county seat to take a last farewell of their husbands, sons and brothers, which caused a small attendance at the fair, while the exhibition was large, and called for a large amount of premiums. The Hon. S. F. Miller addressed the society, which was highly applauded.

From unavoidable causes, a general report was not made for 1861. The fair of that year was held in the village of Hobart, and was a decided success. The exhibition of stock was large and of excellent quality. Of ox teams there was a large and splendid show. Of horses there was exhibited a number of very fine pairs. Of other horses, stallions, brood mares, colts and single horses, the show was large and of good quality. The ladies at that fair *fairly outdone themselves.* They filled a large building to overflowing with their handiwork of every name and nature. The mechanical department was well represented.

The fair for 1861 was the first ever held for three days, and it required all the time to do justice to the exhibitors. The address was delivered by the Hon. Judge Gould, of Columbia county, N. Y., and was highly applauded as being the best ever heard on any occasion of the kind.

Officers for 1863: Peter G. Northrup, President; P. Rice Ferguson, Recording Secretary; R. E. Davis, Corresponding Secretary; George W. Hanford, Treasurer.

C. BECKER, *President.*

HOBART, DELAWARE COUNTY, N. Y.

DUTCHESS.

I take pleasure in offering a brief report of the transactions of the agricultural society for the year 1862.

A trial of mowing machines, under the direction of the society, was held in July, resulting in the exhibition of a large number, and showing great improvements in this branch of agricultural machinery. On the 16th, 17th and 18th of September the society held its annual fair. Since the previous exhibition the society has extended and improved its grounds,

so that it now has upwards of twenty acres strongly inclosed, with track handsomely graded, stables for horses and cattle, pens, agricultural hall, offices and other buildings, nearly all that are required, all permanently built and in perfect repair. The members of the society flatter themselves that, with their extensive fixtures, and with the natural beauty and adaptation of their grounds, their accommodations for holding an agricultural exhibition can be excelled by but few, if any, counties in the State. The attendance was large, equal or nearly so to any previous year.

The exhibition of stock, farm implements, vegetables, grain, fruit, flowers and needle and ornamental work was good in every department, and the interest in the efforts and success of the society is increasing with every succeeding fair. There is evidently a growing disposition among those in attendance to give their attention to things of an amusing or exciting character, particularly the trotting of horses. Whether this will lead to good results or not, I cannot say, but such seems to be the fact. The receipts were larger than ever before, and everything seems to promise support and success for the future.

Officers for the year 1863: Abram Staats, President, Red Hook; William W. Haxtun, Treasurer, Poughquag; George Sweet, Secretary, and John U. Abel Clove, Assistant Secretary, Washington Hollow.

Respectfully submitted.

GEORGE SWEET, *Secretary.*

Essex.

The Essex County Agricultural Society held its annual fair on the 25th and 26th of September last at the fair grounds in Elizabethtown. The entries in some of the departments were not as numerous as in some preceding years, but were of unusually fine quality.

The raising of thorough-bred cattle and sheep is becoming more and more a specialty with some of our best farmers, and their number is rapidly increasing in the county.

The finances of the society are in a most satisfactory condition, as to which I would respectfully refer you to the report of its treasurer.

The society held its regular annual meeting to-day (the 16th December), and elected the following officers for the ensuing year: President, Col. William E. Calkins, Ticonderoga; Secretary, Orlando Kellogg, Jr., Esq., Elizabethtown; Treasurer, Charles N. Williams, Elizabethtown; and one vice-president from each town in the county.

I trust that the State society and its numerous auxiliaries in the various counties and towns may not find their interest waning or their usefulness impaired, even amid the exciting experiences of our national struggle, but may advance the good work for which they were instituted to yet higher and more extended success.

I have the honor to submit the foregoing somewhat informal report.

Very respectfully,

R. L. HAND, *Secretary Essex Co. Ag'l Society.*

GENESEE.

The Genesee County Agricultural Society held its annual fair on Wednesday and Thursday, the 17th and 18th days of September, 1862. The display of animals and articles was meager, and everything on the first day indicated a failure, but the second day's exhibition was better. The first day was devoted, as usual, to the display of stock principally, the attendance small and the receipts comparatively nothing. The second day the premium animals and articles of the first day were exhibited, with a show of the speed of horses. This day the proceeds were good, which enabled the directors to pay all premiums awarded, the interest on their grounds, incidental expenses, and some old debts of the society, and leave a small balance in the treasury, which has not been the case for some years. I am of the opinion that if the farmers of Genesee county could be made to see the necessity of one good fair, a fine display of domestic manufactures, cattle, horses, sheep, swine, and in fact everything connected with agricultural pursuits, it would bring with it money sufficient to liquidate the debts of the society, so that in after years the officers will not be embarrassed as to means to offer premiums and a surety to pay all awards. If our country's good does not wholly absorb the public mind next fall, I am inclined to think we shall have such a fair; if not, the society must still remain crippled. We hope for the best.

Respectfully, H. M. WARREN, *Secretary.*

GREENE.

The annual exhibition of the society was held, but continual rain for the three days assigned for the fair, rendered the show far inferior to former exhibitions.

The officers for the society, 1863, are: Rufus H. King, President, Cattskill; Horatio L. Day, Secretary, Cairo; Luke Roe, Treasurer, and five vice-presidents and six directors. H. L. DAY, *Secretary.*

HERKIMER.

At a meeting of the Herkimer County Agricultural Society, which was held January 10, 1863, George W. Pine, President, in the chair, Josiah Shull, Secretary, the report of the treasurer was read and accepted. George W. Pine was re-elected President; Isaac Quackenbush was elected Secretary; Jacob Devendorf, Treasurer; and an executive committee of one from each town. Delegate appointed to attend the State Agricultural Society, James Folts, Esq. G. W. PINE, *President.*

I. QUACKENBUSH, *Secretary.*

JEFFERSON.

The annual exhibition of the society was held on the 17th and 18th of September, 1862, and the annual meeting January 14th, 1863.

The overwhelming gloom, which the unfortunate civil or *uncivil* war in which we are plunged, its draft upon our members, its tax upon our time and peace, have combined to lessen the interest and attendance upon annual agricultural exhibitions, and ours has not proved an exception. The

highest anticipations of the board of managers have, however, been more than realized; the entries far exceeding expectations, and the attendance much greater than anticipated. Unfavorable weather the second day, aided by the passage of about twelve hundred of our youthful friends, in the capacity of soldiers, through town, *en route* for the seat of war, in the forenoon, much detracted from the attendance that day; yet the fair was a perfect success, paying all expenses and premiums, and leaving a surplus to lessen claims for improvements.

The several departments were represented as follows:

Thorough-bred cattle	19
Oxen and steers	26
Grades and natives	42
Stallions	9
Brood mares, colt by side	14
Colts, 1, 2 and 3 years old	33
Horses in harness	100
Sheep, in different classes	93
Swine (pigs not counted)	18
Coops of fowls entered	10
Total number entries of animals	364
No. of entries in mechanical, domestic, fancy, fruit, artistical, dairy, and vegetable departments	508
Total entries for 1862	872

Treasurer's account:

Expenditures	$826 22
Total receipts	777 60
Balance due treasurer	$48 62

Statement of awards:

Cash awards	$512 25
Diplomas	183
Books	67 vols.
Genesee Farmer	18 do
Working Farmer	18 do
Transactions	11 do

BUTTER.—1ST PREMIUM—DANIEL TODD.

Butter made from 13 cows, June 16 and 17; salted with Ashton salt, three-fourths of an ounce to the pound; salt and butter weighed before mixing; butter washed in ice water until perfectly clean; worked and packed with a ladle.

SECOND PREMIUM—A. P. SIGOURNEY.

This sample of butter was made in June last, from the milk of sixteen cows. Milk was kept on rack in cellar; set in tin pans, about five quarts in each; skimmed when 36 hours old; cream kept in stone jar set on cellar bottom (cement); stirred every 12 hours. I churn three times per week in thermometer churn; cream tempered, by use of soft water ice, while churning, to 60°; butter rinsed with two waters in churn; removed to worker; ice water used for rinsing while working; freed from buttermilk by working—the water is worked out; butter weighed; returned to worker, and one oz. "Factory Filled" salt to one pound of fresh butter is added, and worked in by lever until brine appears; butter immediately packed; covered with moistened salt; has remained untouched from the day of packing.

Tub prepared by putting into it, while dry, 1 quart salt, and pouring into it a pailful of boiling water; replace cover immediately; stand 12 hours; fill tub with cold water; stand with brine in it two days; empty and rinse with fresh water; ready for use. I certify that the foregoing statement is true; made the butter myself.—A. P. S.

BEES.

A Report on management of the Honey Bee, by Joel Wells, Watertown, Jefferson county, N. Y.

The bees were put into this hive I now exhibit, on the 5th day of July, 1862. The surplus boxes now on the hive were filled where they now stand, with the addition of three pounds in a third box. From forty swarms in the spring I have had seventeen new colonies, and from all, both old and young, I have 627 pounds of surplus honey.

Bees usually swarm once each year; if not, twenty-five pounds of surplus honey may be taken from them, which is equivalent to a swarm, making at least one hundred per cent. on capital invested. The after swarms will pay for the hives, provided they are of the kind most approved of by our prominent bee keepers, called the Quinby hive.

For wintering bees I prefer a dry cellar. Raise the hive one inch from the bottom board, give ventilation through the top, and upward ventilation to the cellar, and by keeping the light excluded, know of no better way to winter bees successfully. Bees may be wintered in a cellar where water stands the year round, by inverting the hive, and giving ventilation through the hive and upward ventilation to the cellar. I put my bees into winter quarters between the 9th and 13th days of November. I see them as often as twice a week through the winter. After the frost is out of the ground in the spring, I take them out and carefully remove all refuse matter from the bottom board, and by repeating it at least twice a week I keep the bee moth from getting a lodgment among the combs, until the bees become numerous, and then I let them manage in their own way.

When swarms begin to issue I place ventilating bottom boards for as many swarms as I think will come off that day, at suitable distances, on which I set cribs for the purpose of giving more room for bees and prevent their leaving for the woods. This crib adds one-third to the capacity of the hive, and must be removed by the fifth day after the bees were hived.

My surplus honey I obtain from my first swarms, as a general thing. I put the boxes on the third day after the bees were hived, and remove them as soon as they are filled.

To prevent bees from robbing, close the entrance so as but one bee can pass at a time, and put a ventilating bottom board under the hive.

JOEL WELLS.

September 16, 1862.

CULTIVATION PEARS.

To the Secretary of the Jefferson County Agricultural Society:

Sir—In offering these several varieties of pears for exhibition I hereby conform to the rules of the society by giving a statement of my mode of cultivation, etc.

My trees are set very close together, between eight and ten feet apart.

Between the trees I plant currant and gooseberry trees or bushes, and occasionally cabbage or strawberry plants. My trees are about half standards and half dwarfs. I cultivate the ground thoroughly through the summer, but not very deep, say four to six inches. In the fall I put, say half a bushel of manure round each tree; early in the spring haul it from the trees and spread it over the ground; about the first of June fork up the ground thoroughly, and keep it free from weeds and grass all the season. I have applied around the trees charcoal dust and cinders from the blacksmith's shop, half bushel per tree. This I find keeps the soil moist and loose. I have no doubt as to its being beneficial to the health of the tree. I believe in thorough trimming and cutting back; this I do occasionally all the season, but more generally about the first of September. When a tree is winter killed I cut it back to where the wood is sound, even if it takes off the whole top; by this means I soon get a new, vigorous and healthy tree. If not cut back the tree will soon wither and die; the sap from dying limbs and branches will soon poison the whole tree. I have for sale and now growing in my garden, some thirty dwarf and standard bearing pear trees, the fruit from which in part I now exhibit; also 100 two year old Delaware grape vines for sale, growing on my ground, one dollar per vine.

Very respectfully, yours,

E. S. SALISBURY.

ADAMS, *September* 17, 1862.

Officers 1863: Thomas V. Maxon, President; A. P. Sigourney, Secretary; J. B. Tyler, Treasurer. The annual address was delivered by the Hon. S. H. Hammond.

LEWIS.

The annual fair was held in this county; but we have no returns, other than the premiums paid and the financial condition of the society, for the Comptroller's office.

The winter meeting was held, but as those competing for premiums had not complied with the rules of the society, no premiums were awarded.

Officers for 1863: A. H. Buck, President, Lowville; F. B. Morse, Sec'y, Lowville; A. H. Lee, Treasurer, Turin. Two vice-presidents, 6 directors, and 3 auditors of accounts.

It would have been gratifying to those who have our Transactions to have had a statement of the farming and dairy interest of this county. No statistics are returned. It is hoped that a report for the ensuing year will be one showing the great progress this, one of the leading dairy counties of the State, has made.

MADISON.

The Madison County Agricultural Society held its 21st annual fair at Hamilton, October 9th, 10th and 11th, 1862.

The first day was devoted exclusively to entering articles for premium. The second day was pleasant; and the large number of visitors present pronounced the exhibition one of the best the society ever held. The third day was cold and unpleasant, and the number of visitors was small.

. The receipts of the society for the year 1862 have been as follows:

From the State	$120 00
Taken at gates	230 00
Memberships for 1862	144 00
Pedlers and exhibitors	53 16
Memberships for 1863	53 00
	$600 16

The disbursements have been as follows:

Expenses of fair	$264 97
Premium list	506 00
	$770 97

On account of the limited receipts and the unusually large amount of premiums offered, those entitled to the premiums accepted 75 per cent. of the amount awarded.

Officers for 1863: J. Newton Messenger, President; C. Carskaddan, Secretary; Theodore F. Hand, Treasurer.

CHAS. C. PAYNE, *President.*

STERLING SMITH, *Secretary.*

MONROE.

The State fair being held at Rochester, on the show grounds of the county society, the society omitted a separate show, and united all their energies for the State fair, and contributed largely to the success of the exhibition. The society tender their thanks to the Monroe County Society for their most efficient co-operation.

Officers for 1863: Joseph Harris, President, Brighton; J. S. Hobbie, Secretary, Rochester; F. W. Lay, Treasurer, Greece.

NIAGARA.

The past year has been marked with stirring events. Civil strife has spread sorrow broadcast throughout our fair land. Though hundreds of our sturdy sons, accustomed to till the soil, have left their firesides to defend "The Flag of the Free;" though the unbounded generosity of our farming community has showered forth the gains of long years of toil to support the brave hearts that have gone to battle for the right; still the *husbandry* in our midst has not been neglected, and the soil, in return for proper culture, has yielded an abundant harvest.

At the beginning of the year the society was under a debt of about eight hundred dollars. By a contribution received, and the balance in fund after paying off the premium list and current expenses, this amount has been reduced to about one hundred and fifty dollars.

In the month of June, a sheep-shearing was held, on the grounds in Lockport, under the direction of the society. Much interest was manifested, and it became apparent that much attention is being given to the raising of the various grades of sheep.

On the 25th, 26th and 27th of September, the annual fair was held on the grounds. The first day was devoted to the exhibition of stock, &c. While the number of entries was not large, the grade of stock was superior. The exhibition of sheep greatly excelled that of any former year.

The second day was devoted to the exhibition of domestic manufactures, fruits, discretionary articles, &c. There was never a finer display of fruits, both "amateur" and "professional." It seemed as if nature had been striving to outdo herself. The third day was devoted to trotting, &c. It was spirited and exciting.

The attendance during the whole time was unusually large. The 151st Regiment N. Y. S. V., and four batteries of Light Artillery were encamped upon the grounds, and added much to the interest of the occasion. Their fine military deportment, in all the duties of the camp, elicited the warmest commendation, and showed most conclusively that, while we may boast of the products of our labor as tillers of the soil, we, too, are able, willing, and determined to maintain the constitutional authority that protects our homes against the ruthless violence of traitors from within, as well as against the daring insolence of foes from without.

HENRY SHAFT, *Secretary.*

ONEIDA.

The Oneida County Agricultural Society held its twenty-second annual fair at Rome on the 9th, 10th and 11th of September, 1862. Some apprehension was felt by its friends that the society might be seriously embarrassed in consequence of the war excitement, which at that time, when recruiting for the army was rapidly going on, seemed to absorb all the energies and thoughts of the community. The society had commenced the year with a small debt, and the managers, in readjusting the premium list, had kept this fact in view, but made no reduction in the premiums offered in the more important departments, feeling that a period when the resources of the country were so heavily burdened by the existence of a fearful war, was also a period when the interests of *agriculture*, which lies at the basis of all our prosperity and power, should not be neglected, but that the work of bringing forth from the soil the material for sustaining the life of the nation should be stimulated into greater activity. The result was gratifying to the friends of the society. The exhibition was a very handsome one, particularly in the stock and fruit departments, and the receipts were sufficient to pay off the old debt and the premiums for the current year so far they were called for, leaving a small balance in the treasury. The address was delivered by Hon. Henry S. Randall, of Cortland, and was marked by his characteristic ability and vigorous thought, while of a character to be practically useful to the farmers, who listened to it with unabated attention.

The resources of the society being so low, no premiums were awarded at the winter meeting, but there was a volunteered exhibition of fruit, grain and roots, comprising many choice samples.

Officers for 1863: George Benedict, President; Roderick Morrison, Secretary; H. S. Armstrong, Treasurer.

EDWARD HUNTINGTON, *President.*

ONTARIO.

The annual exhibition of the Ontario County Agricultural Society was held upon the fair grounds of the society at Canandaigua on the 24th, 25th

and 26th days of September, 1862, but was not as well attended as usual, owing to the very severe afflictions which had fallen upon some of its active members, in the deaths of their friends in the army.

The three days were pleasanter than usual, and the receipts on the several days showed the same lack of interest on the part of the mass of the people in cattle, sheep and swine which has been noticed in all societies.

The receipts on the first day, when the cattle, sheep and swine were exhibited, amounted to $65.33. There were 50 head of cattle, 174 sheep, 9 entries of swine and 27 of poultry and small animals.

On the second day the receipts were $451.81. Entries—Horses, 135; fruits, 32; vegetables, 113; family manufactures, 25; needle work, 41; artist and fancy work, 59; family products, 53; butter and cheese, 10; farm implements, 21; mechanics, 37.

The third day is devoted to the exhibition and trial of horses.

The total number of entries was 811. The receipts from all sources were over $1,300.

The annual meeting in the winter was held the last Wednesday of January, 1863, at which, however, the attendance was slim and the entries not what they should have been. Five statements of field crops were handed in, and twenty entries of seed grains. I give a brief synopsis of the statements in reference to the cultivation of the crops.

FIELD CROPS.

Ira R. Peck, East Bloomfield—1st premium potatoes.
Ira R. Peck, East Bloomfield—1st premium peas.
Ira R. Peck, East Bloomfield—1st premium beets.
O. N. Crane, Hopewell—1st premium wheat.
A. D. Porter, Canandaigua—1st premium beans.

Ira R. Peck raised upon 84 rods of land 154 bushels of potatoes. The land was in a medium state of fertility; was a clover sod, and pastured for three seasons; no manure applied; plowed on the 15th and planted on the 22d of May; three bushels Prince Albert and two bushels red potatoes; hills three and a half feet apart; cultivated and hoed twice; dug, measured and housed second week in November. The cost of cultivation amounted to $15.

Ira R. Peck raised upon 2 7-16 acres 90 bushels of peas. The soil was gravelly loam, mixed with clay, slightly manured; no manure applied to present crop; plowed in the preceding November, and sowed by hand on the 16th of April; covered with wheel cultivator and rolled; harvested last of August with horse rake and thrashed with machine; six bushels of "Canada branch" variety were used. Cost of cultivation, $22.

Ira R. Peck raised upon 40 rods of land 255 bushels of beets. Soil deep gravelly loam, and very fertile; previous crop of corn highly manured and cultivated; eight loads of manure applied to this crop; plowed and planted the 24th of May in drills three feet apart, with one pound of seed of white and yellow French sugar varieties; cultivated and hoed three times; gathered, measured and housed the second week of November. Cost of cultivation, $12.

Oscar N. Crane raised upon 4 acres and 46 rods 181 bushels of white

Soule's wheat. Soil a gravelly loam; previous crop barley; field was summer fallowed; plowed first in April; harrowed and manured at the rate of 18 loads to the acre in June; plowed again last of July; harrowed the fore part of August; plowed third time about the 8th of September; then harrowed thoroughly and the seed drilled in about the 13th of September, sowing two and one-fourth bushels to the acre. Expense of cultivation, $55.35.

A. D. Porter raised upon 87½ rods of land 26¾ bushels of beans. Soil clover sod; turned over in the fall previous; cultivated before planting; planted last of May, in rows 2 feet 10 inches apart by 18 inches, at the rate of one bushel of seed per acre; hoed once; no other cultivation; no manure; variety medium; marrows planted by their side did not yield half the quantity. Cost of crop, $14.50.

At the winter meeting, "the proceedings of the Agricultural Society of Ontario County, at the Fall exhibition, held at Canandaigua, on the 3d day of October, 1820," were read. Then, "Old Ontario" embraced all of Ontario, Livingston, Yates, Monroe and Wayne, lying east of the Genesee river and west of the "Pre-emption line." Monroe county had no existence then, with her beautiful city; but was nearly of age, for she left her mother the next year, and, with some towns taken from Genesee county, set up for herself.

The premiums offered by the Ontario County Society, in 1820, were in keeping with the number of acres she then covered. Three hundred and fifty dollars were offered as premiums, on "best organized and improved farms."

"Twenty dollars, for the greatest quantity of wheat of good quality, on one acre," was awarded to Edgecomb Chappel, of Avon. Eighty bushels, eleven lbs. and thirteen oz. on one acre.

Twenty dollars for best yoke of working oxen. Ten dollars were awarded "to Darius Carter, of East Bloomfield, for a fine bred sow, with a litter of *thirteen* pigs, less than five months old, averaging 150 lbs. each." When this was read, a member of the present society rose and said; "Yes, and three of that litter were brought up on bottles," as the sow was three short in nursing accommodations for her large family.

"Over two thousand persons continued on the ground, notwithstanding a heavy shower of rain, and manifested the highest satisfaction at the stately, rapid and orderly movments of the teams and the skillful management of the plowmen."

The above proves two facts. First, that a "rainy fair" is an hereditary institution. Second, that farmers *then* believed in plowing, and would look at competitors, during a fair; which few will do *now*.

This record was very pleasing to hear, but a sad one it also was, telling "how one generation cometh and another generation goeth."

Of the officers named, but one now remains. Gideon Granger, president, died shortly after this. John Greig, secretary, Mark H. Sibley and Walter Hubbell, committee, have, within the last few years, been taken from us.

Of all the persons to whom premiums were awarded, I recognize none now lingering with us, and meeting with us in our "Farmers' Holiday;" but their names are familiar as household words, and their children and

grandchildren yearly gather to our "Annual Festival," and to the festivals of "Old Ontario's Daughters."

I add the following statement, which Mr. James H. Simmons, of this town, has prepared, at my request, as showing what a practical farmer can do, if he will drain his land properly.

DRAINING.

I make the following statement, for the benefit of any that have wet lands that need draining. In the spring of '59, I purchased forty acres, adjoining my farm, on which corn was grown the previous year. I plowed and sowed with barley and oats, and seeded with clover and timothy, and made a poor crop. My neighbors, as usual, expressed their opinions about the purchase, and said I had paid too much for it, as the south part of it had not grown a crop, for the past twenty years, that paid for the labor bestowed upon it. It was a heavy soil, with several slight sags or depressions running across it, with a gradual descent to the west, sufficient for drainage; a portion of it so wet, it had never been plowed. In 1861, I determined to try and grow a crop of fall wheat on it, and a good one if possible. Having been, heretofore, acquainted with John Johnston, near Geneva, a very successful farmer and the father of underdraining in this country, I asked him to see the land and give me instructions about draining it, which he very kindly did.

I went to work, and put in about 200 rods of tile drain, being all I thought necessary. I plowed deep twice, and gang-plowed once, and top-dressed about one-third of the field with rotten barn yard manure, on the highest portions of it. Some of my neighbors were kind enough to prophecy I would break down, if I spent so much money in farming.

I drilled in the wheat, fifty-two quarts to the acre, of a very early variety of bald red wheat, on the 4th and 9th of September, and the eighteen acres averaged a little over thirty-five bushels per acre, by weight; the portions of the land, formerly wet, grew very evenly with the other portions, and averaging as much as the higher ground.

JAS. H. SIMMONS.

P. S.—So well satisfied was I with the result, that I have now about 1,000 rods of tile drain land, and am yet continuing the work, till I get my whole farm drained.—J. H. S.

GIDEON GRANGER, *Cor. Sec'y.*

ORANGE.

The twenty-first annual exhibition of the Orange County Agricultural Society was held on the society's grounds, at Goshen, October 7th, 8th and 9th, 1862.

The weather was fine, the attendance large, the arrangements more complete and convenient than on any former occasion, and the exhibition in many respects one of the most encouraging and successful ever held by the society.

Profiting by the experience of past years, and desirous of emulating the successful example of sister institutions, the society has leased, for a term of years, suitable grounds on which to hold its future exhibitions. A large and commodious building, two stories high, has been erected for the recep-

tion and exhibition of articles. A spacious observatory extends along the front of the upper story, affording a fine view of the entire inclosure. The building, in its mode of construction and internal arrangements, is well adapted to the purposes of its erection, enabling exhibitors to arrange and exhibit their articles with dispatch and convenience, and affording ample facilities for examination to the public. A fine graded track, half a mile in length, on which the speed and merits of horses are tested, encircles the grounds, the whole being inclosed with a permanent fence.

The show of cattle was good. That of working oxen has not been excelled at any previous show.

The display of horses was very fine, embracing many noble animals, exhibiting traits of endurance, and possessing great speed and almost faultless form.

The show of sheep was highly creditable, their superior excellence being a subject of general remark.

Swine were shown in limited numbers.

Agricultural hall was decorated with a degree of skill and taste well worthy the fair daughters of Orange. They did not, however, exhaust their skill and taste in mere decoration. Evidences of their industry covered the spacious walls and filled the extended tables. Here woman reigned, and she reigned in a department replete with beauty, unequaled in any former year for its brilliancy, and for its varied display of rich handiwork.

The display of fruit was the best ever shown by the society. The collections were extensive and attractive. The specimens were of superior excellence. They received and merited the unqualified admiration of all visitors.

The samples of cereals and vegetables, though not extensive, were of unusually good quality.

The exhibition of butter and cheese was not what it should have been, nor what was to have been expected from the first dairy county in the State.

The department of implements and machinery was crowded with the results of mechanical ingenuity and skill.

The annual address was delivered by A. S. Van Duzer, Esq., of New York.

A grand agricultural ball took place under the auspices of the society, on the evening of the third day. It was well attended, and in all respects was a splendid affair; the good order and efficient management that prevailed, contributing much to the pleasure and harmony of the occasion.

The treasurer's report represents the finances of the society to be in a highly flourishing condition.

The success which has attended this exhibition has left a favorable, and it is to be hoped an enduring impression on the minds of our farmers. It has given such an impetus to the society that its sphere of usefulness will be materially widened, and its beneficent effects will doubtless be far more apparent in the future than they have been in the past.

The following persons have been elected officers of the society for 1868: President, Thomas Edsall, Goshen; Vice-President, Hamilton Morrison,

Montgomery; Corresponding Secretary, David A. Morrison, Montgomery; Recording Secretary, George W. Greene, Goshen; Treasurer, William M. Sayer, Goshen.

CONDITION OF AGRICULTURE.

A gradual advance and healthful progress in agricultural improvement may be noted in this county in each succeeding year. New lands are cleared, wet lands reclaimed, rough places made smooth, and the number of improved acres annually increased. The soil is cultivated more thoroughly, and in a more workmanlike manner than formerly. Stones are taken out, stumps pulled, bushes cut, holes filled, ridges leveled, and the surface of the ground rendered smooth. The improvement in this respect is mainly due to the general introduction of mowing machines. These machines are used by nearly every farmer, and the ground is prepared for their use by the removal of all obstructions.

Draining is extensively practiced, and in all cases with the most satisfactory and encouraging results, the drained land generally producing the best crops, and repaying the expense of drainage in a very short time. Most drains are constructed of stone, its abundance rendering it the cheapest and most convenient material. Tile is used in some localities.

The improvement in farm buildings is noteworthy, and evinces in an unmistakable manner the prosperity of the farmer, and the regard he has to the comfort of his stock.

Dairying is the predominant agricultural interest of Orange county. Milk and butter are our chief products. Nature and art have combined to effect this. The rich pastures of our hill slopes and our valleys produce grasses of unrivaled sweetness. Numerous streams and innumerable springs, in all parts of the county, furnish abundance of pure water. Our means of transportation are unequaled. The Hudson river, the New York and Erie railroad, the Newburgh Branch and the Warwick Valley railroad enable us to send the products of our dairies to market with a facility that dairymen in other parts of the State do not possess. Our dairies are justly famed for their excellence, and great care is taken to maintain their high reputation. In their formation, the milking qualities of the animal are invariably regarded as of *primary* importance. The census of 1860 shows that, in proportion to the amount of improved land, this county contains a larger number of milch cows than any other in the State. The eagerness with which our dairy products are sought after, and the high prices they command in the great markets of the land, furnish the best evidence of their superior quality.

DOMESTIC ANIMALS.

Cattle.—There are but few thorough-bred cattle in the county. Grades of all breeds abound. The Devons are generally preferred for working oxen, and the Durhams for fattening. The Ayrshires are justly esteemed for dairy purposes. Our "natives" are unsurpassed in excellence.

Horses.—For a number of years past particular attention has been paid to the rearing and training of horses. Great care has been taken in their management. The introduction of the best blood has been encouraged. Many of the most celebrated horses in the Union have stood in the county

for successive seasons. The result of this is seen in the superior quality of our horses. They are not excelled by those of any other section of the country. The Hambletonian stock appears to be most sought after, and usually commands the highest prices, although the "Morgans," "Stars" and "Clays," each have ardent admirers.

Sheep.—The number of sheep kept has increased during the past year. The increase is attributed to the advance in the price of wool, and the *imposition of the dog tax.* It is thought the statistics will show an increase of twenty-five per cent. since 1860. Long and middle wooled breeds are preferred to the fine wooled varieties.

Swine.—Considerable light pork is fattened in this county. The amount is not increasing.

FIELD CROPS.

Wheat.—The breadth of land sown with wheat is rapidly increasing. In former years this crop was quite extensively cultivated in this county, but owing to the ravages of the Hessian fly its cultivation was nearly abandoned. Its exemption from this enemy for a few years past, and the almost uniformly good crops that have been produced, have encouraged its culture. The statistics for the present year will show that its cultivation has increased nearly fifty per cent. since 1860. The Mediterranean is the principal variety raised, though other kinds are being sown. The past season has been favorable to this crop. The average yield is estimated at nearly twenty bushels per acre.

Rye.—Rye is largely grown and good crops usually raised. This year the crop is considered an average one. Yield about twenty-five bushels per acre.

Corn.—This is one of the staple grain crops of the northern towns. The past season has been very unfavorable. It is perhaps safe to say that not more than two-thirds of an ordinary crop has been harvested. The average yield this year is about thirty-five bushels per acre. Eight-rowed yellow is the variety generally planted.

Oats.—Oats are extensively cultivated. The past year has been unfavorable. Owing to the ravages of an insect, and to severe drought, the grain is very light, weighing about twenty-five pounds per bushel. Average forty-five bushels per acre.

Buckwheat.—The poorest land, that which is most exhausted, broken, and difficult of cultivation, is devoted to this grain, and yet large crops are often harvested. The present crop is about an average one. Yield about thirty bushels per acre.

Potatoes.—Potatoes are grown in considerable quantities. Their cultivation is increasing. White Mercer, Early June, Peach Blow, and Prince Albert, are the leading varieties. The crop has been comparatively exempt from disease this year. The average yield is estimated at 150 bushels per acre.

Roots.—Sugar beets, mangels, and ruta bagas, are grown in small quantities. Carrots are raised to some extent, and are growing in favor. They are highly valued for feeding horses.

Hay.—The past year has been favorable to this crop. The amount baled and sent to New York is large, and rapidly increasing. This business is chiefly confined to the northern towns.

FRUIT.

Within a few years a marked and growing interest has been evinced in the cultivation of fruit. New orchards are being set out on nearly every farm. More apple trees have been transplanted within the last two years than in the ten preceding. All the leading varieties are planted. The Baldwin, Rhode Island greening and Domine, are particularly adapted to this locality. The past season has been very favorable for the growth and maturity of all kinds of fruit. During the year the Newburgh Bay Horticultural Society has been organized. Its first annual exhibition was held at Newburgh, in September last. The display of fruits, flowers, etc., was one of the finest ever made by any society in the State. It fully maintained the high reputation of the fruit grown on the banks of the Hudson.

The farmers of Orange have just reason to be thankful for the rich blessings of the past year. They have abundant cause for gratitude in the general enjoyment of health, their exemption from violence, and in the bounteous harvests which have crowned their labors. While war has been raging in other portions of the land, its progress marked with desolation, and its track blackened with ruin, they have been exempt from its ravages. Peace has reigned around their hearths; plenty has filled their barns, and remunerative prices have been realized for the surplus products of their farms.

A comparison of the census returns of 1850 and 1860, defective as they are, will afford some idea of the progress of agriculture in Orange county.

	1860.	1850.	Increase.	Decrease.
Cash value of farms	$21,010,783	$17,585,393	$3,425,390	.....
Value of farm implements	$638,823	$451,823	$187,000	.....
Number of horses	7,988	8,262	.....	274
do working oxen	2,830	2,376	454	.....
do milch cows	40,406	38,938	1,468	.....
do other cattle	8,120	13,197	.....	5,077
do sheep	14,763	23,562	.....	8,799
do swine	37,682	42,051	.....	4,364
Value of live stock	$2,574,411	$1,953,092	$621,319	.....
Number of bushels of wheat	34,658	46,527	.....	11,869
do do rye	283,848	292,926	.....	9,078
do do indian corn	538,743	491,074	47,669	.....
do do oats	512,137	390,834	121,303	.....
do do potatoes	261,106	146,331	114,775	.....
do tons of hay	98,170	96,593	1,577	.....
do *pounds of butter	3,033,805	3,769,034	.....	.....
do gallons of wine	5,238	908	4,330	.....
Value of orchard products	$41,271	$15,921	$25,350	.....
do garden do	$48,851	$3,797	$45,064	.....
do animals slaughtered	$434,677	$372,042	$62,635	.....

DAVID A. MORRISON, *Secretary.*

ORLEANS.

The sixth annual fair of the Orleans Agricultural Society was held in Albion, on Wednesday and Thursday, September 17th and 18th, 1862.

For several years preceding the present, rain has seemed to be one of

* The decrease in the amount of butter made is owing to the great increase of the milk business in the central towns.

the *indispensables* to an Orleans county fair, so much so as to become proverbial. This year a kind Providence smiled upon us, and we were permitted to enjoy two of the finest days of the season, to the encouragement of all our agricultural friends.

For various reasons our usual spring horse exhibition was omitted.

The society have labored under embarrassments, pecuniary and otherwise, in consequence of the neglect of the officers of the past year in failing to make an annual report to the State, which deprived us of our annual appropriation of $75.

In common with other societies, we have sensibly felt the embarrassment under which we are necessarily involved by reason of the gigantic struggle of war in which we are engaged. Our young men, and men of middle age, have nobly responded to their country's call, leaving the plowshare and pruning-hook for the more destructive weapons and missiles of war. Notwithstanding all this, the agricultural interests have been energetically and efficiently prosecuted. A more liberal and extended list of *cash* premiums was never before offered by the society. The result showed an increase of interest, and a corresponding increase in the number of articles on exhibition, while the attendance was all that could be reasonably expected under the present unhappy circumstances of our country. Let it be borne in mind our county is among the smallest of the State, containing only nine towns and 237,489 acres of land, and a population of less than 29,000.

Aside from the county fair, there is held, in the western part of the county, an union town fair, conducted with enterprise and ability.

The total of entries was 408—though by no means large, yet larger than ever before. Of these, there were exhibited eight thorough-bred stallions, 22 mares and colts, and 15 span matched horses. Of cattle there were 25 entries, and only one of swine. Of horses, cattle, and swine there was a decrease from some former years in the number of entries, but in quality no ways inferior.

Sheep.—Of sheep there were 56 entries, surpassing any exhibition in this department, by far, ever given on our grounds, and of a character which reflects great credit to the wool-growing farmers of our county, which, though small, yet, in this department, claims a niche as high as many other counties of western New York.

Poultry.—There were 11 entries of poultry.

Mechanic Arts.—The mechanic arts were thinly represented, compared with other years.

Vegetables, Butter, Cheese and Fruit.—Of these there were 115 entries. The display of fruit was unusually large and of decided merit. The past season has been one of unbounded prosperity in this department, as the choice selections of apples, pears, peaches, &c., upon the tables seemed to indicate. The grape vines have produced bountiful and delicious clusters, which speak well for the season and soil.

Floral and domestic hall compared favorably with former years, though a few entries less. The quality supplied where quantity was deficient.

In horsemanship, by the ladies and boys, there was a spirited competition, each vieing with the other for the prizes.

Near the close of the second day, a trial in speed of young, but those commonly known as green horses, was given, characterized especially by its fairness; closely contested, resulting in favor of the "Harkaway," owned by Wm. D. Ring. Time, 2.51.

Another of the interesting features of the last day of the fair was an address, on the grounds, by Roswell Hart, Esq., of Rochester, N. Y., in which the people with one accord gave him their undivided attention, as he so earnestly and patriotically referred to the present unhappy condition of our country, and the duty which every agriculturist and citizen owes it in this time of so great peril and embarrassment.

As a whole, the fair passed off in a pleasant time, and in a pleasing, and, we confidently hope, profitable manner.

The following extracts from the treasurer's book show the financial condition of the society:

Received from all sources during the year	$549 27
Paid in premiums, expenses of fair, &c.	561 00
Deficit	$11 78

The annual meeting of the society was held on the 8th day of December, and the following officers were elected for the year 1863: President, Abner B. Bailey, Albion; Vice-President, John Remely, Albion; Secretary, Timothy C. Bailey, Albion; Treasurer, Paul Pratt, Albion; Cor. Secretary, Joseph M. Cornell, Albion.

STATEMENT OF CROPS.

The past year has been one in which the husbandman has reaped a rich reward for his labors. Crops in general have been unusually good.

Winter Wheat.—Crop better than for several years past, averaging perhaps 20 bushels to the acre; less disturbed by the insect than for 10 years.

Spring Wheat.—Almost a failure, on account of the aphis, or what is commonly called lice; averaging less than 10 bushels per acre, with good straw.

Indian Corn.—Good crop, and well ripened; 35 bushels shelled corn; no frosts till very late.

Rye.—But little sown, wheat being more profitable.

Barley.—Very little sown; culture decreasing.

Oats.—Well strawed; not over a two-third crop, on account of the aphis, the same as in spring wheat; averaging about 30 bushels per acre.

Buckwheat.—Not an important crop, but good.

Potatoes.—Good growth; rust and rot appeared but very little in this county; good time to secure them; average 150 bushels.

Peas.—Good crop; 30 to 40 bushels, and an increase in the quantity raised.

Beans.—Scarcely ever better, and well secured; averaging 15 bushels; and prices highly remunerative; best crop raised at present prices.

Hay.—Not quite as good as usual, not averaging over one and a half tons per acre.

The general condition of farming was never better. Laboring hands are very scarce, by reason of the war; but almost every man seems now called upon to earn his living by the sweat of his brow in some one occupation or another. Industry and frugality never go unrewarded.

ABNER B. BAILEY, *President.*

Oswego—(Mexico.)

The undersigned, Hiram Walker, President, Luther H. Conklin, Treasurer, and John R. French, Secretary, of the Oswego County Agricultural Society, pursuant to section nine, of chapter 425, Laws of 1855, hereby make out and transmit a statement of the transactions of said society for the year 1862, viz:

The board of managers met from time to time, designated the days for holding the annual fairs, prepared a premium list, caused the same to be printed and distributed, received over one hundred and fifty dollars paid in by voluntary contributions, made the usual and necessary preparations for holding the annual fair, until about the 1st of September, when, the public mind being absorbed in procuring volunteers to the U. S. military service, under the President's call for 600,000 men, the board of managers yielded to the universal desire of all persons interested, and postponed said fair for one year, believing it to be their duty to yield whatever should be required upon the altar of their country.

The following is a list of the officers for the ensuing year, elected at the annual meeting, held at Mexico, December 8th, 1862: Hiram Walker, President, Union Square; W. B. Randolph, Vice-President, Pulaski; John R. French, Secretary, Mexico; L. H. Conklin, Treasurer, Mexico.

HIRAM WALKER, *President.*

Oswego—(Fulton.)

The twenty-third annual fair of the Oswego County Agricultural Society was held at Oswego Falls on the 8th, 9th and 10th days of October, 1862, and was the most successful of any fair ever held in our county. The amount of receipts was $1,237, and the expenditures, including premiums, $1,125.

The annual meeting was held on the 7th of November, and Gardner Wood, of Fulton, was chosen President; Robert Oliver, of Oswego city, Vice-President; S. G. Merriam, Treasurer, and John U. Smith, of Oswego Falls, Secretary.

JOHN U. SMITH, *Secretary.*

Otsego.

The seventh annual fair of the society, under the new organization, was held under circumstances different from any which had heretofore attended our yearly festival. On no previous occasion, for the past six years, had the weather been otherwise than favorable; although varying somewhat with each succeeding season, yet at no time was it so unpleasant as to deter the thousands of our farmers from assembling on their gala day.

But the morning of the day appointed for the fair of 1862 was an unmitigated damper on all who looked for any out-door enjoyment; and the sorry appearance of the gathered stock, which had been herded the previous day upon the grounds, gave little promise of a satisfactory exhibition, even should the ominous clouds relent and disperse for a more genial day on the morrow. Still the presence of a large number of exhibitors, who already thronged the village, made the managers unwilling to entirely postpone the fair until a more propitious season, and it was resolved to

hold over until the succeeding day in the hope of a more favorable issue.

Jupiter Pluvius, however, was unrelenting, and resolved that there should be no show for that week unless under umbrella canopies. There may be some occupations and exhibitions which can be conducted during stormy weather, but we hold it to be an established fact that no successful agricultural fair can be held during a pouring rain storm. Under these circumstances the managers were reluctantly compelled to postpone the fair until the succeeding week, to which determination there were but few dissenting voices.

The days on which the fair was finally held, being the 7th and 8th of October, seemed to be once more a return of the heretofore good fortune of the society, and the weather was all that could be desired. But the effect of the postponement was sensibly felt in the attendance and receipts of the first day, although the immense outpouring of the multitudes who crowded every avenue to the village and the fair grounds, on the second day, was admitted to have been rarely equaled. The success of the fair was at once placed beyond a doubt, although the pecuniary results were not quite equal to one or two previous years, owing to the largely increased expenses attendant upon the postponement.

The exhibition was, in most departments, an advance upon any previous fair. The number of cattle, sheep and swine was so unprecedentedly large that the heretofore ample accommodations of the society were found to be unequal to the increased demand made upon them. The floral display alone was unfortunately wanting, owing to the fact that every garden in the vicinity had been stripped of its entire available resources for the benefit of the exhibition of the previous week. This was much to be regretted, as the contributions were unusually excellent in quantity and quality.

The enlarged area of the society's grounds, now numbering some fifteen acres, afforded increased facilities for locomotion, and rendered the whole exhibition much more enjoyable than heretofore, while the splendid half mile track, which had been graded and completed during the past season, gave free scope to the owners of fast nags to exhibit the merits of their respective steeds to advantage, while the more sober roadsters were not in any way crowded or incommoded.

In consequence of the heavy expense incurred in grading the new track, and the erection of fences to inclose the additional area, the debt of the society has been somewhat increased; but this was to be expected, unless the fair had been held under circumstances unusually favorable. The board of managers confidently expect that, should the two succeeding fairs be attended with an average success, they will be enabled to present to the members the present enlarged and beautiful grounds entirely free from incumbrance.

The society, through their officers, take this opportunity to express their entire satisfaction with the present laws of the State in regard to the formation and protection of agricultural associations; and that they were in a condition of gratifying and progressive prosperity until the passage of the recent enactment for the collection of agricultural statistics, which they cannot but regard as a demand upon the society unnecessarily burdensome, and very unequal in its operations in the different counties.

There are nearly 400 school districts in Otsego county, in each of which the society is expected to find some prompt and competent person who is willing to devote his time to the object. How these numerous, and many of them remote, districts, in which there is not a single member of the society, are to be reached, and the blanks distributed without almost endless correspondence, or the employment of numerous sub-agents, for whom there is not a dollar of compensation provided, the society has not as yet been able to discover.

In view of these facts, and of many other difficulties not here enumerated, we would respectfully suggest that if it is desirable to collect these statistics, as no doubt it is, that it be made the duty of the trustees in each school district to procure the same; and that the most that be required of the society should be the footing and tabular statement of the whole in suitable form for publication, itself a matter of no small moment in a county like Otsego.

Officers for 1863: Alfred Clarke, President; Horace M. Hooker, Secretary; G. Pomeroy Keese, Treasurer.

Receipts	$2,056 60
Balance due treasurer	257 34
Total	$2,313 94
Expenditures	$2,313 94

A. CLARKE, *President.*

QUEENS.

The season for making our annual report reminds us that we are brought to a stand point, from which a review can be taken of what has gone before, and examine our success or failure; a season, when we may profitably recall our past history, and properly digest plans for future usefulness.

The most ardent members of our society little thought, twenty-one years ago, when, without precedents or details, they commenced with willing and earnest minds its organization, that it would become one of the most cherished institutions of the county; yet by constant perseverance, step by step, as its plans have been developed and carried out, has it been successfully supported, until its annual meetings have made pleasant as well as profitable the labor of the tiller of the soil.

The past year has been the most eventful in the history of our country; and while a large number of its sons have volunteered to reassert our rights to freedom, and contend for them in another revolution, those left at home with their wives and daughters have not remitted a tittle of their exertions for the support and advancement of the objects for which our society was established, as its most prosperous year, now closed, will testify.

We are truly grateful for what has been done, but shall consider our work unaccomplished until our county arrives at greater perfection in all those things relating to agriculture, horticulture and household industry.

The twenty-first annual exhibition of the society was held on September 18th, 19th, 1862, at the Fashion Pleasure grounds, Newtown, which was generously placed at our disposal by the proprietors. The grounds contained

about seventy acres, surrounded by a brick wall ten feet high, with a main building, built of the same materials, 600 feet long, divided into various halls, also handsome rooms set apart for the ladies' departments, surmounted by seats sufficient to accommodate 15,000 persons. The spacious mansion on the grounds was used for the reception of guests and as dining rooms, and was handsomely furnished.

The building in which the fruit, flowers, vegetables, &c., were exhibited, was so large that many did not realize the amount of articles exhibited; any display, however great, would appear comparatively small in such an immense edifice. In the vegetable department last year the table room was 510 square feet, this year 985—nearly double. The largest show of vegetables was made by T. D. Cock, of Locust Valley, who exhibited 91 varieties.

In the department of fruit and flowers last year 480 square feet was occupied, this year 1,030—more than double. In the horticultural gallery the show of rare exotic plants was very extensive. The amount of fruit, flowers and vegetables far exceeded any previous exhibition; the display was most delightful to the olfactories and decidedly tempting to the palate.

The display of hot-house grapes was probably the most extensive ever seen in the State.

The principal exhibitors were Parsons & Co., Cadnus, Macdonald, Buchanan, Chamberlain, Donadi, Marc, Wilson, Mantel, Burgess, Leverich, Supple and others. Dairy products and grain were poorly represented. The show of cattle very fair, especially in Short Horns, Devons and Alderneys.

Special premiums were offered as follows:

By Flushing Railroad Co. for the best road horse	$100 00
By S. R. Bowne, Esq., for the best stallion	100 00
By Fashion Pleasure Ground Association for the best pair of horses for the road	250 00
	$450 00

Of course horses were the leading feature. How could it be otherwise on Long Island? Particularly when the fair was held on one of the most fashionable race courses in America, and it was with some difficulty the officers prevented it falling into a mere trial of horses, to the neglect of everything else.

One of the most pleasing features of the fair was the disposition of the fruit, vegetables and flowers, which the exhibitors desired should be donated to the Soldiers' Hospital in New York city, for the benefit of the sick and wounded defenders of our country. Before starting for the hospital, the wagons containing the donated articles, handsomely decorated with festoons, wreaths, stars, etc., taken from the fair decorations, with a liberal supply of the "Dear Old Flag," and appropriate inscriptions, accompanied by an escort of carriages, left Newtown, greeted by cheers from the men, waving of handkerchiefs and singing patriotic songs by the ladies, to their destination. The following answer was received from the Ladies' Home:

LADIES' HOME FOR SICK AND WOUNDED SOLDIERS,
CORNER 51ST ST. AND LEXINGTON AVENUE,
NEW YORK, *September* 23, 1862.

JOHN HAROLD, Esq., *Sec'y*:

SIR—The Ladies of the Home for Sick and Wounded Soldiers would most gratefully acknowledge the welcome and generous donation of the "Queens County Agricultural

Society," which reached them on the 20th inst. The splendid variety of fruits, flowers and vegetables, as well as the liberality of the gift, merits their admiration and gratitude, and you may rest assured that it has contributed greatly to the comfort and enjoyment of the sick and suffering. Trusting that the gentlemen of the society may be rewarded for their kind generosity,

In behalf of the ladies, respectfully,

BELLE MATHEWS, *Secretary.*

Queens county may well feel proud of this, her twenty-first exhibition. It was a great fair for war times.

THE WINTER MEETING

Was held at the court house on Thursday, December 4th, 1862. The attendance was very large. Premiums were awarded on the following field crops:

Statement of Thomas Youngs, Oyster Bay Cove, of a crop of white flint corn raised on one acre, as per survey, yielding 101⅔ *bushels:*

The soil was in medium condition, having been in pasture for the last four years. On the 21st October, 1862, carted and spread garbage on the sward at the rate of fifty New York carman loads to the acre. June 30th, 1862, spread on the corn 12,000 fish to the acre. Plowed the sward, April 30th, with a two horse iron beam plow (called the Clipper Eagle), from five inches to six inches deep. It was marked out with a sled with three runners, four feet apart, drawn by two horses. Planted 12th of May, and came up about the 20th; five or six kernels were dropped in the hill; five stalks were designed to be left in the hill. Variety, eight-row white flint; was plowed three times and hoed once. The top stalks were cut about 25th September. Two large loads of stalks, worth $4 per load. The corn was measured in a one and a half bushel basket, which made 231 bushels of ears. The whole of the corn was weighed, and there were 7,365 pounds. I then shelled two baskets, and the shelled corn weighed 73½ pounds, which makes 101⅔ bushels at 56 pounds to the bushel.

Value of Crop.

101 2-3 bushels of corn, 70 cts	$71 16	
Worth of stalks in the lot	8 00	
Total		$79 16

Expenses.

Cost of garbage at the landing	$10 00	
One man and team, one day carting	3 00	
12,000 fish, at $1 per 1,000	12 00	
Carting fish	2 00	
One man and team, plowing and harrowing, one day	3 00	
Marking and planting	1 00	
Three times plowing	2 00	
Hoeing once	75	
Five men, one day harvesting	5 00	
Total expense		38 75
Profit of crop		$40 41

THOMAS YOUNGS.

Statement of Charles H. and Ambrose Waldron, Matinecock, of crops of onions and carrots on the same land, containing 111 *rods, as per survey.*

Soil, a very fine sandy loam, slightly damp, in onions previous year. Manured with 43 loads (14 bushels each) of stable manure, spread and plowed

in six inches deep. Planted with late onion (red) seed, eight pounds to the acre, in hills six inches apart in the row, rows twelve inches, about the 12th April. Carrots planted by hand, after the second hoeing of onions, about the middle of May, in hills on an average eighteen inches apart, in every third row of onions.

ONIONS.

Receipts.

Produce, 134 barrels.		
25 barrels sold in New York at $2 per barrel	$50 00	
32 barrels sold in New York at $2.50 per barrel	80 00	
77 barrels bunched, 5,822 bunches, sold in New York at $3.50 per hundred	204 12	
		$334 12

Expenses.

43 loads manure at 60 cts. per load	$25 80	
Unloading from sloop and turning manure	2 25	
Spreading	3 00	
Plowing, harrowing and bushing	1 13	
Raking and drilling	1 50	
Five and seven-tenths pounds of seed, at 50 cts. per pound	2 85	
Commenced hoeing May 11th; hoed four times; two men, one and a half days each, at 75 cts. per day	9 00	
Two men, three days pulling and cutting tops	4 50	
Eight men and one team, half day carting	3 75	
Fifty-seven empty barrels, at 20 cts. per barrel	11 40	
Bunching, at 50 cts. per hundred	29 16	
Straw and twine	5 88	
Labor	5 00	
		105 17
Profit on onions		$228 95

CARROTS.

Receipts.

Produce, 187 barrels; sold, without barrels, in New York, at 75 cents per barrel	$140 25	
		$140 25

Expenses.

Two men, one day planting, 75 cts. each	$1 50	
One and a quarter pounds of seed, at 75 cts. per pound	94	
Two men, one day hoeing (after onions were pulled)	1 50	
Two men, four days digging and topping	6 00	
		$9 94
		$130 31

Recapitulation.

Amount of sales, onions and carrots	$474 87	
Whole cost	115 11	
Profit on 111 rods of land		$359 26

CHARLES H. WALDRON,
AMBROSE WALDRON.

We further state that we have raised and done all the labor without assistance, except a small portion for which we returned labor in payment, of which the above is a part.

Four acres (not actual measurement) of onions, mostly for bunching, and not sold in barrels, produced 2,582 baskets, 32 of which filled 10 barrels, equal to $806\frac{7}{8}$ barrels; and on a portion of the same land, planted in the onion rows, as stated above, 437 barrels of carrots.

Seven-twelfths of an acre (not measured) of seed produced 150 pounds when cleaned; and between these rows 32 barrels of turnips. Half an acre of turnips, after the onions were taken off, produced 33 barrels. Seven pounds of carrot and eight pounds of turnip seed were used.

CHARLES H. WALDRON,
AMBROSE WALDRON.

Premiums were awarded on grain, butter, vegetables, poultry, &c. The show of grain and butter was large.

THE ASPARAGUS BEETLE.

Proceedings of Meeting for Conversation, organized at the Annual Meeting, 11 o'clock A. M., December 4, 1862, D. K. Youngs, conducting.

A number of gentlemen being present, interested in growing asparagus, the subject of the asparagus beetle (a new insect, imported, as is supposed, from Europe) was introduced.

D. K. Youngs, after describing the insect, its transformations, habits and increase, and exhibiting drawings (furnished by Dr. Fitch) in the Annual Register, 1863, stated that it was first noticed by him in the summer of 1861, in very small numbers, not sufficient to attract much attention. In May, (about 10th) 1862, it again appeared, and increased so rapidly that by the 5th of June much of the asparagus was so eaten that it was unfit for market, and by the middle of June, in some places, one-eighth of the whole crop was destroyed. One of his neighbors thought that his loss on seven acres amounted to four hundred dollars.

Mr. John Quin furnished information (in writing) which is tolerably conclusive that the beetle was first noticed at Astoria in the summer of 1859.

Mr. F. Briell, of Astoria, first saw it on his beds in 1860; their depredations were slight during that season, greatly increased in '61, and this summer one bed was entirely destroyed, the roots being so much reduced for want of top to support them, that he had it plowed up. Has observed large numbers of swallows about the beds this fall, and supposes they were feeding upon the beetles.

Mr. Rebone had his beds entirely destroyed the past season.

Capt. Monson, of Astoria, had his beds attacked in 1860; in 1861 the tops were all eaten, but from some cause the beetles all left about the last of August, and a few new shoots sprang up unmolested. The last summer all the tops were completely barked, and the roots showing rapid decay were broken up.

Mr. King, of Flushing, has had them two years in his beds; has tried lime, salt, and a strong solution of potash, all to no purpose; thinks if they are not soon destroyed the asparagus will be.

Thomas Duncan, gardner for E. J. Wooley, Esq., thinks he had less of the insect this year than last, and attributes it to mulching with sea-weed last winter; has found quantities of the beetle secreted under the leaves about the beds this fall, evidently laid up for the winter.

Mr. Edwin Hoyt had his beds almost destroyed; a new bed planted two years ago is weaker now than the first season.

A gentleman from Newtown states that his beds have escaped, except some seedlings, which were all destroyed.

Mr. Isaac Buchanan, of Astoria, has kept his men killing them, and by this means saved his beds—thinks the remedy would not be practicable on a large scale.

D. K. Youngs advised that all the young seedlings (volunteers) be destroyed as soon as they appear, as it was found at the last cutting season that most of the eggs, indeed all that hatched, were attached to them, and remaining there undisturbed hatched out the worms, which very soon found their way to the large and more tender shoots, causing most of the damage; if these were kept down the eggs would be deposited on the large shoots, which in every instance would be cut before they had time to hatch, which would require about ten days. He also suggested keeping young chickens on the beds to pick off the beetles and worms, but is not sure that the worms will not prove poisonous to them, as they always, when disturbed, emit a drop of dark colored fluid from the mouth, apparently as a weapon or means of defence. Small birds were found dead about the beds at Oyster Bay last spring, supposed to have been poisoned; has seen old fowls eat the beetles without injury.

A gentleman stated that a portion of his bed, where the chickens had free access, was not injured.

Mr. Riker had noticed the same result in a friend's garden.

Mr. William J. Youngs, of Oyster Bay, had noticed but few of the insects this season, and supposes they have but just reached that section of the county, as he concludes from all the statements that they were first introduced about Astoria, the extreme western limit, and had traveled in three or four years just about the length of the county (between thirty and forty miles), and probably, if, as is supposed, Astoria is the place of introduction, extended themselves, in every direction where asparagus is cultivated, about that distance.

D. K. Youngs, in answer to questions, stated that he had placed a beetle in a glass jar, which deposited from three to seven eggs in a night; that these eggs in July hatched out worms in about eight days; that the worm commenced feeding immediately, and acquired its growth, say three-eighths of an inch in length, in about twelve days; it then passed to the bottom of the jar, under some twigs of asparagus, and wound a slight web about it, and in some ten or twelve days more came out a perfect beetle; has not ascertained how long the beetle lives; they are now laid up in winter quarters the same as flies and wasps; it can fly any reasonable distance; thinks the asparagus must all be destroyed in two years if the increase is in proportion from last year to this.

Inquiry was made as to the probable loss the county would sustain, supposing the worst results from the insect.

The town of Oyster Bay reports the annual value of the crop $20,000.

Flushing, Newtown and Jamaica not definitely reported, but supposed each equal to Oyster Bay. North Hempstead and Hempstead perhaps as much.

Estimated value in the county but little short of $100,000 a year, one-half of which is a clear net profit.

Mr. George Bradish, of Flushing, offered some interesting remarks upon the cultivation of hops and osier willow, giving a description of the manner of cultivating and gathering the crops; and as the growing of them to much extent

has not been tried in the county, advises that the society encourage experiments with them. Both crops furnish labor for women and children, which in many places is much needed.

THE ANNUAL MEETING

Was held at the same place, at 2 o'clock in the afternoon, the President, Daniel K. Youngs, in the chair, and John Harold, Secretary.

A very large number of members were present.

Ex-Gov. John A. King, Hon. David R. Floyd Jones, Lieut. Governor and Hon. E. A. Lawrence, ex-presidents, were invited to take a seat by the side of the president.

The premiums awarded at the winter meeting were then announced by the secretary.

On motion, the chair appointed S. B. Mersereau, Wm. Floyd Jones and Roswell Eldridge a committee to audit the treasurer's accounts.

On motion, the meeting appointed the president and treasurer a committee to invest the sum of $1,000 in such funds as they may deem proper.

The following were elected officers for the ensuing year:

John C. Jackson, Newtown, President.

T. D. Cock, Locust Valley, Vice-President.

John Harold, Hempstead, Secretary and Treasurer.

S. B. Mersereau, S. M. Titus and John I. Van Alst, Directors.

On motion, by Hon. John A. King, seconded by Hon. D. R. Floyd Jones,

Resolved, That the thanks of the society are due and cordially tendered to Daniel K. Youngs, Esq., for the able and impartial manner he has discharged the duties of president during the past two years.

On motion, by Hon. D. R. Floyd Jones, seconded by Hon. John A. King,

Resolved, That the thanks of the society be tendered to John Harold, Esq., Secretary and Treasurer, and John C. Jackson, Esq., Director, for their zeal and efficient services during the past year.

On motion, by S. M. Titus, seconded by Robert Willetts,

Resolved, That our thanks are due and cheerfully tendered to Henry S. Leverich, Esq., for many valuable services on the committee of arrangements, and to the various superintendents for diligence and faithfulness in the discharge of their duties.

The receipts and expenditures for the past year are as follows:

Receipts.

Balance on hand at date of last report		$905 41
Received from life members		680 00
do	annual members	951 00
do	entrance fees	1,723 44
do	special subscriptions and donations	659 00
do	State Treasurer	100 09
		$5,027 85

Expenditures.

By premiums	$1,570 13
By fair expenses	1,485 68
By printing and other expenses	441 15
By balance in treasurer's hands	1,530 94
	$5,027 85

JOHN HAROLD, *Secretary.*

CULTURE AND TREATMENT OF ONIONS.

BY DANIEL K. YOUNGS, ESQ., LOCUST VALLEY.

PREMIUM ESSAY.

It is proposed in treating this subject to confine the remarks principally to those most cultivated for the market—such as will stand a sea voyage, rather than those which are raised exclusively for local consumption, although in many respects, indeed most, they will apply equally to all.

VARIETIES.

It seems not to be well understood, or, if so, but little heeded, that to cultivate onions successfully care must be taken to keep the different varieties separate, and that even more attention should be given to difference of shape than color; particularly will this apply to red onions, of which there are three distinct varieties, ripening at such different periods as renders a mixed cultivation next to impossible. The first and earliest are flat or cracker shape, concave at the stem, known as cracker onions; will grow to maturity ten days sooner than the next or second early; these are deeper than the first, with a slight indentation around the stem, and ripen about two weeks before the last or late onions, which are globe shaped and of a deep red color, are the best for keeping, have stronger tops for bunching, and should be raised in preference, where an early crop is not desired.

SEED.

To secure pure seed of these kinds, or indeed of any other, great care must be taken in selecting the bulbs for planting. This is best done by going over the beds and gathering such as have ripened at the same time, with the tops well down and yellow, immediately before the crop is pulled. Spread these on the ground for a few days till the top is dry, when they should be stored not more than a foot thick in a dry airy place. When the weather becomes cold, or when first frozen, cover with any dry litter and exclude a draft of air. Before planting, cut off the tops even with the bulbs, that the new shoots may come up straight in the rows. Plant the different kinds at such distances apart as shall insure against mixing when in blossom (100 yards is quite near enough). Select a reasonably moist soil and give a liberal covering of such short manure as is at hand, plow to the depth of eight inches, thoroughly harrow, bush and rake smooth. Mark off for rows three feet apart, stretch a line, and trench with a hoe three inches deep; set the bulbs six inches distant in the trench, and cover, leaving the ground nearly level. The trenching may be done with a small plow, but not as well or as neatly. Use, for working, a cultivator, or any implement that turns but little furrow, until the seed top runs up; then turn a good furrow to the row, and leave it well rounded; this will prevent, to some extent, the tops lopping about and breaking with the wind. Late cabbage or turnips may be planted between the rows after the last plowing.

When the seed vessels begin to open, and before much loss occurs, cut off the heads with about an inch of the stalk, and carefully deposit in tight baskets, where it should not be allowed to remain long, as it will heat in ten

or twelve hours. Spread as soon as convenient, in a single layer, on lath or net frames, exposed to a free circulation of air; leave in this situation until the whole head becomes brittle, so that it will readily rub in pieces between the hands, say six or eight weeks; during this time much of the seed will fall out; this is considered the best, and may be collected and kept by itself. Collect the heads on a tight floor, and rub or thresh till all the seeds are detached, and clean with a grain fan, or, what is more effectual, immerse in a tub of water, when all the good seed will sink and the chaff may be poured off; it must then be dried by spreading in the sun with as little delay as possible to prevent sprouting, which may occur in the course of two hours. Before the general planting, the seed should be tested by planting a few in a hot-bed, or, if in much haste, tie up a small quantity in a piece of muslin and place it in a vessel of boiling water; in a few minutes all the good seed will be found sprouted.

SEED BEDS. PLANTING.

Onions may be grown from seed on most soils, from a light sand to a heavy loam, but an easy working, sandy loam, such as is not likely to bake, and free from stones, is most desirable. In order to insure a full crop the first year, it should have been well manured and kept clean for one or two previous seasons.

Spread liberally with short fresh manure in the fall, or well rotted in the spring. Of course the kind and quantity must, in a great measure, be determined by circumstances; I would give horse stable manure preference (we use it at Matinecock, Queens county, almost exclusively, at a cost on the land of sixty-five cents for fourteen bushels, the New York car load, and about one hundred loads to the acre); but any manure on the farm, if applied in a proper state, will produce good results, as will guano, fish, ashes or plaster; but, with the exception of fish, I would advise these to be used in addition to other manures, say 250 to 300 pounds of guano to the acre, sown before harrowing, or carefully between the rows after the first hoeing. As the roots will penetrate to the depth of fourteen inches or more, the subsoil plow should be used, but the manure should be mixed as thoroughly as possible with about five inches of the surface soil.

As it is highly desirable to plant early, plow as soon as the state of the ground will permit, and harrow thoroughly; use a bush harrow to break the lumps and smooth the harrow marks; lay off in beds twenty-five yards wide, and *rake even and fine;* this last is very important.

If the object is to raise only barrel or bushel onions, the beds should be marked for rows thirteen inches apart, with any instrument at hand; a rude and cheap but convenient marker is made of pine plank, two by three inches, with pins six inches long inserted thirteen inches apart, the same as harrow teeth, with a tongue five feet long to draw by, so attached as to hold the teeth perpendicular when raised to the position it would naturally be held in drawing; draw this by a line the first time, and then let one outside tooth follow in the last mark; if it should become slightly crooked, straighten by the line as at first; this applies only to drills, planting one row at a time; for this purpose four pounds of seed (or about ten seeds to the foot) will be sufficient for an acre, and may be planted with any good brush drill that will deposit

and cover about half an inch below the surface; this should be followed with a light garden roller, to leave the surface as even as possible for the first hoeing.

As soon as the rows can be traced, work out with a shuffle hoe, and commence weeding a few days after, or soon as any can be found in the rows. To keep the beds at all times clean, which is by far the cheapest and best way, this should be repeated about every ten days, till the tops begin to fall, which will require one tolerably active man to a moderately weedy acre.

For bunching, from six to eight pounds of seed, according to strength of soil, is required; usually six pounds is enough. These should be planted in hills, for various reasons—less hand weeding will be required, the size will be better graded for bunching, will bottom with more certainty, and mature a little earlier. For this work the Bristol (Rhode Island) drill is a good machine, planting two rows at a time, one foot apart, and six inches between the hills. The number of seeds to the hill will vary from five to fifteen. None but the most careful and observing hand should be selected to run this or any other drill.

For working, a very light, narrow drag hoe should be used, hung so as just to shave the surface; with this an expert workman will keep two acres clear, without over-working.

When a large business is attempted, the three kinds should be planted in the proportion of one acre first early, two acres second early, five acres of late. As the first early have weak tops, they should be pulled before any of them become dried, about as soon as they have fallen and slightly yellowed. Three or four days of good weather will be sufficient to cure the tops; they should then be cut and thrown in heaps of about half a bushel, and allowed to remain two or three days, or until the top is well dried, before housing. By this time the second early will have sufficiently matured, and as they in a measure have the same defect of top as the first, they require about the same treatment. If planted in the proportion and quantity suggested, with the ordinary number of hands, say seven or eight, the late ones will now be ready, when the pulling must keep pace with the ripening; but those having strong tops will not require the nice care of the others, as they may be allowed to remain longer without topping, and in the heaps, if not convenient to house immediately; but success in keeping, provided proper buildings are prepared for storing, depends upon pulling at the right time; never wait for a growth after the tops fall and yellow; there is danger of starting new roots, which is fatal to the crop. Allow them to remain exposed to the sun only as long as is necessary to dry that portion of the top remaining with the bulb, or the color will be injured. Cut at least two and a half inches from the bulb, or just below the junction of the leaves, and leave in heaps till the stems are soft and dry; turn the heaps after the dew is off in the morning, pick out all large enough for barreling, reject the hard necked ones, and house before the dew begins to fall.

On pulling, let each workman take six rows, pull three at a time, laying the bulbs evenly where the middle one is taken out, with the tops straight towards or across the right hand row; when across the bed, turn to the left and take the remaining three, and lay as before; this will leave a space between the rows of bulbs, the width of three rows, or about three feet for the heaps when cut. Cut in the same direction, with the left hand always to the bulb, and cast immediately in heaps about two yards distant, and finish up each round

in this way; six rows will make one row of heaps, with the space for depositing them always clear of tops, and the work greatly facilitated; for a left handed workman reverse the whole thing.

Whenever the crop is larger than can be readily marketed from the field, or when it is desired to hold late in the season, a building should be prepared expressly for the purpose; the usual resort for storing a surplus, the barn floor, stable, wagon-house, corn-crib, &c., &c., will serve for a small quantity spread thin, but a quantity that will not admit of spreading cannot be secured in them with any kind of certainty, except certainty of loss. This is bought knowledge, dearly paid for.

ONION HOUSE.

I can offer no better opinion of a building than by describing the one we have in use, which has answered every expectation, in keeping several thousand bushels, the last and present season. This is a frame building, covered with shingles, 30 by 40 feet, 3½ stories, eight feet between the floors, and a narrow loft in the ridge; this loft is used for storing potato onion seed, and holds thirty barrels properly spread.

The half story is used for drying seed; three nets ten feet wide are stretched through the center, one above the other, appropriated to late seed, and is sufficient space for two hundred pounds; two nets four and seven feet wide on each side, one side for second early, the other for first early, white, yellow, &c., small quantities of each; except when in use for seed —about six weeks—the nets are taken down and the room used for storing empty barrels.

The next two stories are fitted with bins four and a half feet wide, seventeen and a half feet long, except those opposite the stairs, which are shorter, six feet high, sided up with lath two and a half inches wide; one and a half inches space between, lath nailed to joist, which reach from floor to ceiling, and serve as supports to the floors. Two passage ways, four feet wide, run through the center each way, with doors or large windows at each end; air passages one and a half feet wide on the outside and between the bins, which also serve as passage ways to the windows, of which there are twelve in each story. The sixteen bins will hold about 5,000 bushels.

The lower story is stoned on three sides, the other open, and flush with the ground, except a room seventeen by thirty feet, with cement floor, for bunching and packing, (this is sufficient room for four bunchers,) to which the onions are brought from the bins above through canvas sacks or leads passing through trap-doors in the passage-ways; the remainder of this story is used for storing the barrels when filled, horse shed and wagon house.

Great care should be taken not to bruise the onions at any time, especially pour carefully in the bins without allowing the basket to touch the heap; and as they will sweat in a few hours, the bin should be kept filled to the desired height from the beginning; commence filling at one end and keep as near perpendicular as possible, and avoid depositing any on the top of those previously stored, even the next day after. If it becomes necessary to place a partition in the bin, let it be made of slats, with an air passage between—a broad partition prevents a free circulation of air, and I have seen damage result from it.

In three or four days after housing, the tops of the bins will be wet to the depth of six inches; no matter, let them remain, do not move them; if they are taken out and spread to dry, the same process of sweating will be repeated as soon as they are put together again, and nothing be gained. Give them plenty of air and no damage will ensue. The first dry windy day the moisture will mostly disappear; if not, reach over the sides and haul the onions from the center each way, leaving a furrow in the middle as deep as the moisture extends; it will then dry off, but it will collect again in calm damp weather, until November or later, but seldom for more than three inches at the top. So long as the body of the heap does not dampen, turn black or throw out roots, let them alone—this last occurring, sell for what you can get as soon as possible; they are past keeping, or at least it is doubtful if they will pay for the trouble of spreading and turning.

ONIONS FOR SETTING, KNOWN IN THE MARKET AS RARE-RIPES.

In bunching there will be some rejected that are too small; these may be kept for early sets or rare-ripes; spread a few inches thick, as they are not apt to keep well in bulk before cold weather. Plant early, with the ground prepared the same as for raising seed, in rows fourteen inches apart, stick them in the row with the thumb and finger, right side up, one and a half or two inches between, and cover slightly; this method is much better than the more common one of strewing them carelessly in drills or furrows, and in the end saves labor. The most of them will throw up seed tops, which must be cut or pinched off close down to the leaves, as soon as the *bulge shows distinctly*, and not before, or another will sprout up in its place, requiring a second operation, will be less likely to bottom, and eventually have a hard stiff neck; but little labor of hoeing and weeding is required, as the tops will be well up before the weeds get a start—the topping is a wet and dirty job. As all will not show the bulge at once, the beds must be looked over three or four times, the last about ten days before pulling, when all may be taken off. The crop when marketed is very apt to come in competition with Bermuda onions, which makes it less profitable than formerly. A fair produce is about four hundred bushels to the acre.

The onion louse, a small yellow insect, sometimes causes much injury, appearing in great numbers, in dry weather, when the tops are well grown, eating the outer covering of the leaf. Probably the first notice we have of their presence is the change of color in the top from a glossy to a dull green, which will progress rapidly to brown, especially if the weather is hot, till the top withers without falling. As they are apt to attack sets, seed and potato-onions first, it is advisable not to have the seed beds adjoining or so near that the insects may pass to them when the early crops are harvested. Plaster sown over the beds, when the dew is on, is believed to be a partial remedy.

At the second hoeing of seed beds, carrots may be planted at intervals of eighteen inches, between hills, in every third row of onions, without apparent injury to the onion crop. The planting may be done rapidly in mellow ground by taking a pinch of seed from a cup carried in the left hand, between the thumb and finger of the right, which is slightly pressed in the earth, at the same time allowing a small quantity of seed to escape

and cover with the knuckles. One pinch is sufficient for five hills. More care will, of course, be required in the next hoeing and in gathering the onions. The carrots will not require thinning, as from three to thirteen will grow very well in a hill when planted at this distance. I have known a crop of 600 bushels onions and 600 bushels carrots grown on the same acre, the past season, planted in this way.

Blight or blast, a withering of the tops, as if exposed to scorching heat, first appears as a black mold or smut on the leaves, sometimes in small spots as large as a dime, at others on most of the leaf, and is liable to occur at any stage of growth, as early as April, on sets at the time the bulbs begin to form on seed beds, and on the seed stalk when in blossom, where it is most conspicuous, causing immediate decay as far as the smut extends; at first turning to a pale green, then yellow, and eventually decay. Whether this smut is the result of disease, excess of moisture in the plant, or external influences, I have not been able to determine; and it would not be noticed here except for the purpose of calling attention to the fact, which appears not to be generally known, that the mold or smut always precedes the withering, and that decay extends no further than the space covered, except the stalk is girdled with it; then of course it will rot off and fall. This may form a link in investigating the subject to its source, and possible remedy, which is very desirable.

Potato onions must be sorted in two parcels before planting; the large, those one and a quarter inches and over in diameter, will produce small ones for seed, and should be set five inches apart, the other three inches. In all other respects plant the same as sets, pull before the tops are dry, and keep, without separating the bunches, precisely as onions intended for seed.

RECAPITULATION.

Be sure and have the right kinds; raise your own seed; work the soil deep; give plenty of well rotted manure; plant early; keep clean; pull when you think they may possibly grow a little more, and always before October, however green; house in dry weather; keep dry and well aired; avoid bruising; prevent frequent freezing and thawing, and do not move them except for good cause. Above all, and without which all other precautions are of no avail, do not leave too long in the ground, and store dry, if you would not have roots and tops, and consequent rot to contend against.

HISTORICAL NOTICES

OF EFFORTS TO IMPROVE AGRICULTURE, LIVE STOCK AND DOMESTIC MANUFACTURES IN QUEENS COUNTY, GLEANED FROM OLD DOCUMENTS AND NEWSPAPERS, FROM 1644 TO 1844, (TWO CENTURIES.)

BY HENRY ONDERDONK, JR., ESQ., JAMAICA.

1644. November 10.—In the patent of Hempstead it is stipulated that the settlers shall pay their tax in wheat or the products of the ground cultivated by the plow or hoe, or if they shall improve their stock in grazing or breeding of cattle, then it shall be paid in butter and cheese.

1651. September 25.—Hempstead produces, from the proceeds of their

servants' labor, corn, beef, pork, butter, tobacco and staves, which they exchange for liquors and other merchandise.—*Colonial History, II.*, 158.

1667. April 6.—Joseph Carpenter proposes to erect a saw and fulling mill at Glen Cove.

1668.—Governor Nicolls appoints a horse-race in Queens county, not so much for the divertisement of youth as for the bettering of the breed of horses, which through great neglect is impaired.

1678.—Tobacco was an important article of culture, as it appears by the following extract: "John Okeson (Kissam) buys of John Smith Rock, on Great Neck, 99 acres of land for £90, to be paid in good merchantable blade tobacco, in casks, to be delivered at the weigh house, New York, at prices current, equivalent to good merchantable pork, wheat, beaver or seawant."

1679.—Thomas Rushmore erects a grist and saw mill at the west side of Great Neck.

1685.—Jamaica grants Ben. Coe and Jno. Hansen the right of setting up a corn and fulling mill on Foster's river.

1698. April 20.—Hempstead grants Major Jackson and Hope Willis permission to set up a grist and fulling mill on Jerusalem river, and the like to John Robinson at the head of Hempstead harbor.

1714.—The sheep parting took place at Isaac Smith's, Herricks, first Monday in October.

1728. May 6.—"The Jamaica fair opens to-morrow, and continues four days, when there will be exposed to sale a variety of goods, merchandise and several fine horses. It is expected the lion will be there to be seen."

1728. May 6.—Josiah Millikin, at Glen Cove, makes periwigs.

1736.—Thomas Parmyter's widow, at Whitestone, offers to sell 20 acres of clay ground, fit for pottery and tobacco pipes.

1743. February 21.—At Musketo Cove a sheep was killed that weighed 152 pounds.

1743. June 20.—Caterpillars and worms of an uncommon kind have done great mischief. In one farm they destroyed a field of barley a mile in length.

1749.—Fulling, dyeing, shearing and pressing home-spun cloth; taking spots and stains out of broadcloths, silks and druggets at Whitehead's mill, Jamaica, by a workman from Europe.

1750. December 10.—Four quarters of a calf, eight months old, were brought to the New York markets, which weighed 417 pounds neat. The skin and tallow weighed 102 pounds neat. The calf was raised by Mr. Benjamin Waters, Newtown.

1751.—Edmund Annely has set up a pottery at Whitestone, and makes vases, urns, flower-pots, &c., to adorn gardens and house-tops, also any other ornaments of clay, by a German family that he lately bought. He can make eight different kinds of ware.

1756. April 5.—A steer, of the age of two years and eight months and a half, bred by Col. Ben. Tredwell, of Great Neck, was killed in New York, whose quarters weighed 850 pounds, and the fat, exclusive of the kidneys, 123 pounds.

1759.—James Burling, of Flushing, dyes and presses all sorts of broadcloth; also dyes and stiffens silks.

1762.—John Nicoll, Whitestone, sells stock for shipping; such as sheep, hogs, &c.

1762. December 22.—There was killed a cow raised by Col. Ben. Tredwell, of Great Neck, whose weight was: the four quarters, 671 pounds; tallow, besides the kidneys, 144 pounds; hide, 63 pounds. This perhaps exceeds any cow killed in the province.

1765.—It is requested that the inhabitants of Flushing, Newtown and Jamaica should meet at John Comes' tavern, Jamaica, January 1st, to agree on officers and rules to advance husbandry and manufactures and suppress luxury.

1767. December 21.—New York Agricultural Society awarded Thomas Youngs, of Oyster Bay, $10 for a nursery of 27,133 apple trees.

1768.—Robert Wooffendale, surgeon dentist, intends residing in Jamaica. He performs all operations on the teeth, gums, sockets and palate. Likewise fixes artificial teeth without pain, and so as to escape discernment.

1770.—A manufacturer from England has taken Tunis Polhemus' fulling mill in Jamaica, where all sorts of woolen cloths, serges and linseys are completely dressed and colored in the English manner.

1770. March 19.—A cow raised by John Aspinwall, Flushing, nine years old, was killed by Ben. Carpenter, butcher, at Jamaica, which weighed in beef, hide and tallow 1,318 pounds.

1773. October 11.—Hugh Gaine, Henry Remsen and Hendrick Onderdonk have lately erected at great expense a paper mill at Hempstead harbor.

1774.—By an act of the Assembly, two fairs for Queens county are to be held at Jamaica, on the first Tuesday in May and the third in October—each to last four days.

1789. October 10.—Washington, while President of the United States, visited Prince's fruit garden and shrubberies, at Flushing. He says: "These gardens, except in the number of young fruit trees, did not equal my expectations. The shrubs were trifling, and the flowers not numerous."

1790. April 30.—Washington, while President, made an agricultural tour through Queens county, and has minuted down in his diary a particular account of his observations.

1798.—William Prince, Flushing, offers for sale 10,000 Lombardy poplars, from ten to seventeen feet high, grafted apple trees, pears, plums, cherries, peaches, nectarines, apricots, quinces, mulberry and fig trees, currants, gooseberries, raspberries and strawberries. Also, horse chestnut, black walnut, weeping willow, and other ornamental trees, with a variety of roses and flowering shrubs and plants. Trees packed in mats, casks or boxes, so as to be sent to Europe or the West Indies.

1800. February 28.—George Hewlett, Hempstead, raised an ox nineteen hands high, seventeen and a half feet in length, and nine feet girth.

1804. September 24.—Ben. Prince, Flushing, offers for sale 100 barrels choice Newtown pippins, now fit to be put up so as to be safely sent to the southern States, West Indies or to Europe.

1812. April 8.—Lewis Hewlett raised an ox which weighed, on the foot, 2,436 pounds.

1814. January 18.—A majority of the judges of the court of common

pleas awarded a premium of thirty-five dollars to Joseph Onderdonk, of Cow Neck, for the best piece of woolen cloth made in the county, twenty-five yards in length and three-quarters wide; but as it was made in Messrs. Jones' factory and not in his family, the Legislature withheld the award.

From 1811 to 1815 the county judges met annually at the court house to award premiums for the best woolen cloths made in the county.

1816. December 8.—William Smith, of Flushing, killed a hog two years old, whose weight was 1,120 pounds.

1817. May 5.—Cobbett landed in New York. He rented a farm at Hyde Park, where he raised seven acres of turnips. He gave great impulse to the culture of ruta bagas in ridges.

1817. November 11.—A meeting was held at the court house to consider the expediency of forming an agricultural society, Lewis S. Hewlett, Chairman, and John T. Cromwell, Secretary. Lewis S. Hewlett, William Jones, Henry O. Seaman, Garret Laton, and Lewis Hewlett were appointed a committee to make arrangements for another general meeting on the first day of December next.

1819. June 2.—A meeting was held at the court house, Daniel Kissam acting as Secretary, when it was voted to form an agricultural society, and adjourned to meet June 21st, when Rufus King was chosen President, and others named as officers, viz:

Wm. Jones, Effingham Lawrence and Singleton Mitchell, Vice-Presidents; Rev. David S. Bogert, Corresponding Secretary; Thomas Phillips, Recording Secretary; Daniel Kissam, Treasurer.

1819. November 2.—The first fair was held at the court house, when $200 was awarded in premiums. No imported animal was exhibited. The list may be seen in the Long Island *Star* of November 3.

1820. November 2.—The Queens county cattle show and fair took place at the court house. There were more people assembled than ever before witnessed in the county on any occasion. A premium was awarded to the owner of the celebrated horse Duroc, to the Hon. Rufus King for the best milch cow, and Joseph Onderdonk for the best ruta bagas. We have not been favored with any other particulars.

1820. November 7.—New York County Agricultural Society awarded premiums as follows:

General Nathaniel Coles, Dosoris, best brood mare, $30. Townsend Cock, of Oyster Bay, horse Duroc, $20. John N. Lloyd, for a bay mare by Duroc, $40.

William Allen, of Great Neck, exhibited fine linen shirting, and James Beatty, excellent linen diaper. Samples of raw cotton, cotton shirting and thread, by Dr. Rodgers, of Jericho, and woolen cloths, by Messrs. Jones, of Cold Spring, and Seaman, of Hempstead Harbor, were much admired.

1821. April.—Singleton Mitchell, North Hempstead, offers for sale 2,000 inoculated peach trees, of three seasons' growth.

1821. November 7.—The Queens county fair was held at the court house. The Long Island *Farmer*, of November 15, has list of premiums.

1822. June 8.—Eleven pounds of very fine and white well washed wool was sheared from a Merino buck, belonging to Mr. James Scott, of Jamaica.

1822. October 24.—The Queens county fair was numerously attended; many ladies, though the day was cold. Specimens of cotton were exhibited by Col. Leverich, of Newtown, and Dr. Rodgers, of Jericho. The address was delivered by the vice-president, Effingham Lawrence, and was printed in the Long Island *Farmer* of December 5th.

Tunis D. Covert, of Jamaica South, raised sixty hills of cotton, and Daniel C. Coles, of Oyster Bay, raised, last year, sufficient to make twenty yards of muslin.

1822. December.—William Remsen, Jr., of Queens county, has raised a sweet potato whose weight was upwards of seven pounds.

1823. May 1.—Henry Mitchell, Flushing, gathered last fall, from one tree, eight bushels of apples, six of which were sent to Liverpool, and realized thirty British sovereigns ($132.22), exclusive of freight and commissions.

1823. June 18.—Rose leaves distilled by Dr. Nathan Shelton, of Jamaica. The roses should be gathered early in the morning, as soon as the flower expands, by cutting the stem below the receptacle. By pulling off the leaves in the ordinary way, the fragrance is lost.

1823. October 31.—The New York County Agricultural Society awarded a premium of $10 to J. H. & W. R. Jones, of Cold Spring, for the best flannel, and to Thomas & W. R. Jones $10, for two pair of woolen blankets. Two pieces of their broadcloth, one of satinet, and one of broadcloth, were highly praised. To James Scott, of Jamaica, $7.50, for a buck and 4 ewes.

1824. November 25.—James Kolyer, of Newtown, raised three bushels of clean flax seed from three quarts sown.

1825. March 12.—Governor Clinton thanks the Messrs. Jones, of Cold Spring, for a piece of flannel, made of Long Island wool, and by American skill, which he pronounces "very creditable to the county."

1825. August 4.—Judge Lawrence, of Flushing, gave $340 for a Saxony buck.

1827. July 12.—A meeting of wool-growers and friends of the American system was held at the court house, Singleton Mitchell, chairman, and John H. Jones, secretary, when Effingham Lawrence, Jones, and Mitchell were appointed delegates to the State Convention, to be held at Albany, July 16th.

1829. February.—Joseph Denton, of North Hempstead, has a ewe which has produced this season no less than six lambs. A specimen of good *breeding* of this county.

1832. December.—Joseph S. Shotwell, of Flushing, raised an ox which weighed, alive, 2,560 lbs.

1833. December 24.—A cow, of Isaac Weeks, was killed at Jericho, which weighed 710 lbs., but what was remarkable, one hind quarter weighed 234 lbs., and the other 144; one of the kidneys weighed 74 lbs. and the other 13.

1833. March.—Richard Seaman, of Jericho, has a cow that had two calves in 1830; in the spring of 1832 she had twins again; and at the end of the same year she had three more—making seven calves in three years.

1834. May.—James O. Hawhurst, of Jericho, has a cow that has three

living calves, and what is more extraordinary, she has had ten calves in five years.

1835. November.—Silas Carle, near Westbury, raised a Mercer potato which weighed 3½ lbs.

1835.—A correspondent of the *Genesee Farmer* says, the horse hay rake was invented by a colored man, who lived on Hempstead Plains, and died there about 1821.

1835.—Platt Stratton, of Flushing, raised five cabbages, the largest weighing 28½ lbs., and the other four together 107 lbs., and were sold in New York for six cents a pound.

1836. April.—Mr. Townsend, of Cedar Swamp, has fatted and sold to Mr. Hyde, butcher, in New York, a pair of oxen, weighing 48 cwt., for the round sum of $1,000. These were the largest ever exhibited in the city. The choice pieces will be sold at 50 cents per pound.

1836. October.—At the fair of the American Institute, Mr. Robt. Thompson, of Flushing, presented two enormous drumhead cabbages, one of which weighed *forty-two pounds*. Mr. James H. Kolyer, of Newtown, presented a rope of onions, 100 in number, weighing 120 pounds.

1837. September 9.—A worthy Hempstead farmer presented the editor of the *Inquirer* with three apples, one the growth of 1835, one of 1836, and the last of 1837, all perfectly sound and delicious.

1839. February 13.—John R. Schenck, of Hempstead Harbor, dug potatoes of the size of a large egg, of this year's growth.

1840. November.—At the fair of the American Institute, Messrs. Mott & Cornelius, of Newbridge, exhibited an ingenious machine for knitting fishing nets.

1841. March.—Mr. John Spader, of Jamaica, has an egg, the size of a pigeon's, that was taken from a hen's egg.

1841. October 2.—A meeting was held at the court house, in accordance with the provisions of "An act for the encouragement of agriculture," for the purpose of forming a county agricultural society. The Hon. Singleton Mitchell was called to the chair, and Albert G. Carll appointed secretary. It was unanimously

Resolved, That it is expedient to form an agricultural society in this county, and that a committee be appointed to report a constitution. The chair appointed Robert W. Mott, of North Hempstead; J. G. Lamberson, of Hempstead; Effingham Lawrence, of Flushing; T. B. Jackson, of Newtown; John Johnson, of Jamaica; and A. G. Carll, of Oyster Bay.

A society was organized October 9th, 1841; E. Lawrence, President; A. G. Carll, Secretary.

1842.—The Queens County Agricultural Society (reorganized) awarded the first premium of $6 to Warren Mitchell, of North Hempstead, for Russia turnips. He raised 137 bushels on a quarter of an acre of sandy soil. He applied 45,000 fish to an acre. The expense was $14.25.

Mr. John Mitchell received the second premium. From a quarter of an acre of loamy soil he raised 153½ bushels. He used 100 loads of New York stable manure to an acre. Expense $20.50.

A stalk of corn was exhibited at the fair, measuring 16½ feet high, grown at Flushing.

1843. January 7.—A calf seven months old, fatted by John Raynor, of Hempstead, and slaughtered by William Creed, of Jamaica, weighed 420 pounds neat.

1843.—Willet Seaman, of Jerusalem, raised on a piece of ground 66 feet long by 30 wide, 48 bushels of large and remarkably fine white onions, at which rate an acre would yield 1,056 bushels. The soil was a fine whitish brook sand, with an equal proportion of loam.

1843. October 17.—The Queens County Agricultural Society held the second fair. Premiums were awarded for corn to John I. Lott, Hempstead, 103 bushels to the acre; Thomas F. Youngs, Oyster Bay, 89½ bushels oats to the acre, and Daniel K. Youngs, Oyster Bay, 205 bushels carrots to a quarter of an acre. John Harold, Hempstead, exhibited oats weighing 45½ pounds per bushel, and Mrs. J. Harold, a straw bonnet made by herself, containing 116 yards of braid.

1843. October 24.—Henry Smith, of Astoria, has a cow, half Durham and half Ayreshire, which has given 37 quarts of milk per day, and yielded 16 pounds of butter per week.

1843. December 12.—Five hogs were fattened on William Morrell's farm, Newtown, which weighed 601 pounds, 532 pounds, 504 pounds, 490 pounds and 437 pounds. Total, 2,600 pounds.

1844.—We have seen a handful of spears of oats raised by Samuel Wood on Joseph Onderdonk's farm, Manhasset, that measured 5¼ feet in length.

1844. September.—William Mitchell raised a peach which weighed 11 ounces and measured over 11 inches around. It was raised from a native stone.

1844. December 7.—The Queens County Agricultural Society awarded Daniel K. Youngs, of Oyster Bay, a premium for 281 bushels of carrots from one-quarter of an acre, 101 bushels of corn to the acre, and 79 bushels of oats to the acre.

1847. 1848.—The receipts of the Queens County Agricultural Society in 1847 for actual members amounted to $152; in 1848 only $100. The treasurer was unable to pay the premiums, and a subscription was taken up for that purpose.

1857.—The Queens County Agricultural Society was regularly incorporated, and received a certificate from the State, dated December 3d, authorizing John Harold, John Bedell, Joseph Tompkins, William T. McCoun, B. W. Doughty, Samuel T. Jackson, Uriah Mitchell, J. P. Smith, Samuel L. Hewlett and Jeremiah Valentine to "form a society for improvement in agriculture, horticulture and the mechanic arts."

Presidents of the Society.

1841 to 1844. Effingham Lawrence, Flushing
1845 to 1846. Singleton Mitchell, Manhasset.
1847. William T. McCoun, Oyster Bay.
1848 to 1855. John A. King, Jamaica.
1856 to 1857. William T. McCoun, Oyster Bay.
1858 to 1859. D. R. Floyd Jones, Oyster Bay.
1860. Edward A. Lawrence, Flushing.

1861 to 1862. Daniel K. Youngs, Oyster Bay.
1868. John C. Jackson, Newtown.
Secretary from 1841 *to* 1850—A. G. Carroll.
Secretary and Treasurer from 1850—John Harold, Hempstead.
*Recording Secretaries**—John G. Lamberson, Edward H. Seaman, Lendal F. Pratt, John H. Seaman and Robert Willets.

The receipts from 1841 to 1850 were $4,029.82, and from 1851 to 1862, $21,961.51.

Rensselaer.

This society met on Jan. 20th, in accordance with its constitutional provisions for its winter exhibition and the annual election of officers. The show of articles of products, although comparatively small, was truly excellent in character and quality. The limit was no doubt a consequence of dispensing with our annual fair in September, 1862. At that time our board thought, almost unanimously, it would be inexpedient to attempt the fair, and resolved not to hold it. Circumstances evidence error in judgment as to the correctness of that decision, and we no doubt lost one of the best exhibitions possible for us to have presented to our fellow citizens. We trust to profit by the past, and hope to make amends for the drawback we feel has befallen us.

We have elected for the ensuing year (slightly amending our constitution prior thereto) the following officers: President, George Tibbits, of Hoosick; Treasurer, Harmon W. Knickerbocker, of Lansingburgh; Secretary, William T. Willard, of Troy.

Our treasurer reports the receipts for the last year (1862) at $2,308.52; expenditures in the same, $2,290.13; balance in treasury, $18.39.

Respectfully submitted.

W. T. WILLARD, *Secretary.*

Troy, *January* 20, 1863.

Rockland.

The nineteenth annual fair of the Rockland County Agricultural Society was held at New City, on Wednesday and Thursday, the 8th and 9th Oct. The display of cattle and horses was very creditable. The attendance upon the first day was not large, but on the second day there was a large assemblage from all parts of the county. The address of Judge Suffern was listened to by some two thousand people, who testified their pleasure by frequent applause.

After claiming that although the occasion was more especially intended for the benefit of the farmer and the artisan, it was not without its interest to the scholar and the professional man. The speaker eloquently described the operations of nature, the great chemist, in aiding the labors of the farmer from "seed time to harvest." The dignity of labor, especially of agricultural labor, its importance and value as an element of individual and national prosperity, its healthful and ennobling influence, its peaceful and benign triumphs, and the great part which our

* Discontinued in 1857.

own country has acted in giving to agriculture its true position, were rapidly reviewed. We regret that our space will not allow us to give the whole of this admirable production. We can find room only for the conclusion, which is as follows:

"From our childhood we have, as a people, been educated in the faith that all the guaranties which encouraged and protected our advancement to the proud position to which, as a nation, we had attained, were fixed and certain, and that the safeguards of our social, governmental and religious policy were as firmly founded as the bases of yon eternal hills.

"That the Bible teaches the great duties of man in all his relations to his fellows, his country and his God, the testimony, the example, the faith of all great and good men who have gone before, abundantly exemplify. That the divinely appointed union, by which men are separated into families, and all the sacred affections and blessed endearments of home and of the domestic relations, are cultivated and cherished, is guarded by a common sentiment stronger than the laws which protect the holy covenant. That the federal constitution is the fundamental law of the land, the 'Magna Charta' of American liberty, the safeguard of individual, State and national right, and prescribes and sanctions a governmental policy which jealously and scrupulously guards the precious and inestimable trusts committed to its keeping, and we live in the *constant* exercise of such faith still.

"When the foundations of imperial Rome were laid, the goddess mother of Æneas delivered to him the celestial armor with which to triumph over his enemies, and the shield on which was wrought the anticipated history of Roman glory, down to the reign of Augustus Cæsar.

"When the foundations of the American Union were laid, its guardian angel delivered to George Washington the helmet of eternal truth and justice; the sword with which he had led its armies to victory; and the Constitution of the United States, the shield embossed by heavenly hands with the future history of his country.

"When he had laid the foundation of that noble structure wherein lies enshrined the casket of American liberty, jeweled with the red blood of martyred heroes, and had seen rise its majestic proportions in strength and beauty, he retired to his cherished home on the banks of the Potomac—Mount Vernon, the home of his heart, to which he turned as a haven of repose, after the storms of war were succeeded by the sunshine of peace, and the cares of state no longer demanded his public service, where he might serenely enjoy the full fruition of an anxious life devoted to the best interests of his country, amid the peaceful and ennobling pursuits of rural life. Though his chief record is that of a general and a statesman; though he led the armies of the Revolution under no *riven banner* to victory and to certain triumph, but sheltered them beneath the glorious ensign of the *old thirteen;* and though his name is inseparably interwoven with all that American citizens hold dear, and which is intimately blended with all that belongs to free institutions and good government, yet in his dignified retirement, and amid the seclusion of his rural pursuits, his life and character furnish great living lessons, and examples worthy of the closest study and of all imitation. Though he long since passed from earth to

habitations prepared in the skies, and to the reward of the just, and the flowers of over half a century have bloomed and faded by his tomb, still the virtues he exemplified in his private life, the industry and care he displayed in the management of his estates, his devoted, disinterested love of country, and his reliance and unshaken trust for strength and wisdom, on his God, will ever commend the name of George Washington as a bright model to the farmers of America. He is the great pattern and patron of your profession, farmers of Rockland.

"And may yours be the singular felicity of having lived and acted in perfect keeping and harmony with his example; and to the beautiful order of his life learn to conform the order of your lives, so that the highest aspiration of your hearts shall claim kindred with his spirit.

"From the broad aisles of a glorious past, where the *good genius* of the nation walks unfettered, stream the beacons lighted by our fathers, and rolls down the music of their swelling song, along the lapse of time. Can you not catch the voices of the future mingling with the voices of the past, 'wafted from shrine to sepulcher?' Shall we not pray, and may we not even yet hope, that as the strain rolls on, the clouds will roll back and the storm pass away, and star on star, and State on State, blaze out in all their ancient splendor; and as 'the waves of time break on the white battlements of eternity,' that the lips of millions shall yet thunder up the anthem of Washington and liberty?"

Hon. A. B. Conger moved that the thanks of the society be tendered to Hon. A. E. Suffern for his learned and eloquent address, and that a copy be requested for publication. The resolution was unanimously adopted.

Receipts, $322.58; expenditures, $354.88.

Officers, 1863: M. D. Bogert, President, Clarkstown; John L. De Noyelles, Recording Secretary, Haverstraw; A. Edward Suffern, Corresponding Secretary, Haverstraw; Erastus Johnson, Treasurer, Ramapo; three vice-presidents and executive committee of four.

St. Lawrence.

Herewith are forwarded the account of the treasurer of the St. Lawrence County Agricultural Society for the year 1862, and the vouchers required by law to be sent to the Secretary of the State Society.

The St. Lawrence County Agricultural Society held its eleventh annual fair at Canton, on the 23d, 24th, 25th and 26th days of September, 1862. The fair was held four days, owing to bad weather on the 24th. The weather on the 25th and 26th was favorable; but many exhibitors were kept away by the storm on the 24th.

The number of entries was about 450—a smaller number than usual—and the show was consequently not so good a one as the society has usually been able to report. The entries, however, were almost exclusively from within the county—the principal exceptions being the contributions of fruit, flowers and vegetables by Mr. Hiram Becker, of Watertown, Jefferson county; specimens of the Adirondack grape, fully ripe, of good size, shape and flavor, from Mr. J. W. Bailey, of Plattsburgh; a plow, with new subsoil attachment, (of simple construction, and which on thorough trial

in—among others—a gravelly, stony soil, elicited high commendation from the implement committee,) exhibited by T. B. Ely, of Mexico, Oswego county, and the "Scientific Churn," shown by Hastings & Son, of Malone, Franklin county, to whom a diploma was awarded.

The show was not a fair exhibiton of the resources of the county; however, what was shown was generally very creditable. There were some very fair Devons and Short Horns, some very good long-wooled and fine-wooled sheep, and some grade and native cattle of good quality. There were few horses; some very pretty pairs, but generally under size.

An excellent address was delivered by Mr. Joseph Harris, of the *Genesee Farmer*, treating of the importance of such a course of cultivation, and such rotation of crops, as shall maintain and increase, instead of diminishing the fertility of the soil; of the difference in the value of manure, according to the material of which it is made; and of the necessity for care in the manufacture of butter and cheese, without which the business cannot be made profitable. Mr. Harris gave a very interesting account of the process of cheese making in the English dairy-district of Cheshire, and showed that, while poor butter and cheese were barely remunerative, good qualities paid large profits, at no higher cost. He also enlarged upon the importance of every increase, however small, in the average product, and *quality* of the products, of the farm and country, because the whole increase of product and of value was clear profit.

The attendance, considering the many unfavorable circumstances, was good, and the receipts large. The society received during the year, from all sources, as per treasurer's report, $1,698.49, and disbursed, for expenses of the fair, &c., including premiums, $891.80, and for interest, payment of debts, &c., $679.71, leaving balance in the treasury $126.98. Of the receipts, $1,021.58 were taken at the gates.

The annual meeting was held at Canton, on the 13th day of January, instant. The roads were very bad, thus keeping away many members living at a distance; but the number of members present was 135. Henry G. Foote, of Ogdensburgh, was re-elected President. The Treasurer, E. Miner, Secretary, T. L. Harrison, and Superintendent, were also re-elected. The Vice-Presidents for 1863 are: Nelson Doolittle, of Russell; Allen Whipple, of Parishville; Richard Harrison, of Waddington; Alexander J. Dike, of De Peyster; Abel P. Morse, of Hammond; and Loren Pike, of Rossie, re-elected; and William G. Barnhardt, of Massena, and William J. Barnum, Potsdam, to fill vacancies.

The society's debts amount to about $4,500, of which about $500, outstanding unpaid premiums of 1861, will probably be discharged at forty cents on the dollar, from balance in the treasury. The assets of the society are: real estate, salable at, as appraised, $2,665; personal property about $700.

A movement was begun at the annual meeting to raise the necessary money to reduce the liabilities of the society to a sum which it can easily discharge from its own ordinary resources. A good deal of spirit was manifested, and it is hoped that the attempt will be successful.

A revised constitution was proposed, embodying but one change of importance, viz., that members shall subscribe not for one year only, but

shall be members, and liable for the annual subscription, until they resign and formally withdraw from the society. The whole matter was referred to a special committee, to report to the next annual meeting.

Respectfully submitted. HENRY G. FOOTE, *President.*

SARATOGA.

In sending you an abstract of the proceedings of the Saratoga County Agricultural Society during the past year, with "all such reports or returns as the society is required to demand and receive from applicants for premiums," we have but little to add to our previous reports, by way of information in regard to "the best method of rearing or fattening animals or cultivating the soil." The attention of the executive committee of the State Society was called, in our report for 1861, to the omission of this as well as other county societies, to comply with the third and fourth sections of the act entitled "An act to promote agriculture," passed on the 5th day of May, 1841.

That we are making some progress in the science of agriculture, is very evident from the visible improvement in many departments of our annual exhibitions; and if the information to be derived from these annual gatherings of the farmers is not diffused throughout the State through the medium of your annual reports to the Legislature, it is because you have not been more exacting in requiring a better compliance with the law of our local organization.

The past year has been one of unbounded prosperity to the agricultural classes. A benificent Providence has smiled upon all their operations, and crowned their labors with a bountiful harvest. Whatever we may suffer from the present distracted and warlike condition of the country, may be attributed to human folly and the wickedness of man, and not to Him from whom all real blessings flow.

Notwithstanding the doubts which surrounded other local agricultural organizations, and prevented them from moving forward and holding their annual fairs as usual, our county society intermitted none of its zeal in the cause of agriculture, and held out just as liberal inducements for the display at our last annual fair as if the political world was quiet and peace reigned throughout the land.

The first regular meeting of the executive committee of this society for 1862 was held on the 7th day of June, when they resolved to hold their annual fair at Saratoga Springs on the 2d, 3d, 4th and 5th days of September. A general superintendent of the exhibition was then appointed, with instructions to select and report the number and names of suitable persons to be appointed assistant superintendents, gate keepers, night watch and policemen, with the compensation they were to receive.

A premium list, amounting in the aggregate to $1,553, was then adopted: on agriculture proper; on horses; on cattle; on sheep; on swine; on poultry; on implements from other counties; on mechanical productions; on agricultural implements; on plowing; on butter and cheese; on fruit; on garden vegetables; on flowers; on household productions; on painting, drawing, embroidery and needlework; on horses from other counties and States, and on miscellaneous articles not embraced under either of the fore-

going heads. The judges or viewing committees for each class were appointed at this meeting, and rules and regulations were also adopted for the government of the exhibition.

The following were fixed as the prices of tickets of admission to the exhibition: For every person, 15 cents; carriage tickets, 25 cents, if all the persons in the carriage were duly ticketed; single horse and rider, 25 cents; annual member, $1, to include the member's wife and his children under 21 years of age living at home. Life member, $10.

The next meeting of the committee was held on the 2d day of August, the first business of which was in paying the following tribute to the memory of the Hon. Sherman Batcheller, President of the Society, whose death had taken place on the 3d day of July.

TRIBUTE TO OUR LATE PRESIDENT.

The Recording Secretary offered the following preamble and resolutions, which were *unanimously* adopted:

Whereas, Providence has seen fit to remove by death, from his field of usefulness, the late respected life member and president of this society, Sherman Batcheller, Esq.; and whereas, while bowing to the decree of Supreme Wisdom, we can but deplore the loss of an efficient officer, a public-spirited and worthy citizen, an intelligent and high-minded man; and we take this occasion, sadly but proudly, to place on the records of this association the evidence of our high appreciation and personal regard for our departed colleague, of whose counsel and advice we are now deprived.

Resolved, That we sympathize deeply with the numerous immediate relatives and friends of the deceased, and tender them, in the name of all the members of this society, this evidence of the universal esteem in which he was held both in public and private life.

Resolved, That the successor in office of the late respected president and all the members of this board, during the ensuing exhibition, wear the usual badge of mourning in token of the society's bereavement.

Resolved, That, as a further token of our grief at this sad bereavement, the business office of the society be draped in mourning during the fair.

Resolved, That these resolutions be entered upon the minutes of the society, and that a copy thereof be transmitted to the family of the deceased.

Under the provisions of the act in relation to agricultural and horticultural associations, passed on the 17th day of April, 1862, (Session Laws, chapter 284, pages 241, 242,) the executive committee excluded all the theatrical, circus and mountebank exhibitions and shows, as well as all huckstering or traffic in fruits, goods, wares and merchandise of every description, within thirty feet of the outer line of any of the streets or highways within 200 rods of the society's show grounds, on any of the days of the annual fair.

The assistant superintendents, as recommended by the chief, were appointed at this meeting, and all the preliminary arrangements were made for the approaching fair.

THE ANNUAL FAIR FOR 1862.

The 22d annual fair and cattle show of the Saratoga County Agricultural Society was held on the society's grounds, in the town of Saratoga Springs, on Tuesday, Wednesday, Thursday and Friday, September 2d, 3d, 4th and

5th, 1862, and was largely attended by the farmers and friends of agriculture from the various towns in the county of Saratoga, besides a goodly number of strangers and visitors from other parts of the country. As an agricultural exhibition, it was perhaps equal to any of its predecessors.

The first and the forenoon of the second day were devoted exclusively to the entering and arranging of articles and animals for the exhibition.

The following was the number of entries in each class:

	Entries.
Class 1. Agriculture proper	80
2. First class horses	79
3. Second do	50
4. Foreign do	1
5. First class cattle	48
6. Second do	28
7. Sheep	42
8. Swine	6
9. Poultry	16
10. Foreign implements	4
11. Miscellaneous articles	28
12. Mechanical productions	87
13. Agricultural implements	20
14. Plowing	8
15. Butter and cheese	15
16. Fruit	22
17. Garden vegetables	84
18. Flowers	41
19. Household productions	117
20. Painting, embroidery, drawing and needlework	100
Total	796

The judges were called at 12 o'clock on the second day, when vacancies were filled, and they forthwith entered upon their duties. The gates were opened, and the crowd rushed in from all directions. But the third was the great day of the exhibition, and a larger attendance of the agricultural population was present, from this and the adjoining counties, than on any previous occasion.

At 2 P. M., the society was called to order by the president, upon whose invitation the Rev. Mr. Woodbridge, of the Presbyterian Church of Saratoga Springs, offered up a devout and fervent prayer for the prosperity and success of the society, and the peace and happiness of our beloved country.

The Hon. Augustus Bockes, of the Supreme Court for the 4th judicial district, was then announced by the president as the person invited to deliver the annual address, and was most cordially welcomed by the society and the vast assemblage present from all parts of the country. His address was one of the ablest and best ever delivered before this society, and was listened to with the deepest attention by the large and attentive audience which had gathered around the speakers' stand. It was a source of regret among the farmers that Judge Bockes declined a formal request to present it entire for publication.

The interest in the exhibition was continued and kept up until late in the afternoon of the fourth day. The executive committee was in session daily during the exhibition, directing all things pertaining to the fair.

Premiums were awarded in the different classes. Cash premiums, $955.50; Transactions, 54 volumes; diplomas, 15.

A resolution was adopted by the executive committee at this meeting,

requiring all persons hereafter exhibiting full-blooded horses, cattle, sheep, and swine, to furnish the judges with the pedigree of such animals, otherwise to be excluded from competing for the society's prizes.

Delegates were also appointed to the Vermont State Agricultural Society; to the Warren County Agricultural Society; to the Connecticut State Agricultural Society; and to the New York State Agricultural Society.

The total receipts during the fair, including two life memberships and 512 annual memberships, and from all other sources, was $1,857.38; the incidental expenses, including the repairs and improvements upon the show grounds ($240.08), exclusive of the State appropriation, was $1,033.91; leaving to pay cash premiums $823.47.

The following were elected general officers of the society for 1863:

President—Samuel J. Mott, Dean's Corners.

1*st Vice-President*—Edward Edwards, South Corinth.

2d *Vice-President*—Lewis E. Smith, Mechanicsville.

Corresponding Secretary—James Thompson, Ballston Spa.

Recording Secretary—J. A. Corey, Saratoga Springs.

Treasurer—Milo J. Jennings, Saratoga Springs.

With an executive committee of two in each town.

The regular December meeting of the executive committee failed for want of a quorum, and consequently no action was taken by the board of the past year to execute the law, passed on the 17th day of April last, for the collection of agricultural statistics in the several counties of this State. It will be seen, however, by the note appended to this report, by the incoming president of our society, that the law is being properly executed in this county.

OFFICE OF THE SARATOGA COUNTY AGRICULTURAL SOCIETY,
SARATOGA SPRINGS, *April* 12, 1863.

To the Executive Committee of the N. Y. S. Agricultural Society:

For the reasons stated in the concluding part of the foregoing report, no proper blanks were furnished, and no persons were employed by my predecessor in office, to collect the agricultural statistics in the county of Saratoga, under and in pursuance of an act entitled "An act for the collection of agricultural statistics in the several counties of this State," passed April 17, 1863. That duty has been and is being performed by this society in all the towns in this county, and I design to make my returns, complete, to the Secretary of the State Society, with all convenient speed, and by the middle of April. You may regard it as substantially done at this time.

J. A. COREY, *Recording Secretary.* S. J. MOTT, *President.*

TAX ON DOGS.

Although perhaps not within the purview of the foregoing report, it will doubtless be interesting to the farmers of other sections of the State, especially to wool growers, to know how the law passed by the last Legislature, imposing a tax on dogs for the better protection of sheep, is regarded in the county of Saratoga. It was with some reluctance that some of our town boards of assessors undertook to perform their duties under this law; but it will be seen, by the following statistics, that it has been executed by the assessors as fairly perhaps as any new law can be which encounters the prejudices of a class of people who think more of a

worthless cur than of a carcass of fine mutton or a fleece of good wool. The amount assessed upon dogs in this county, in the past year, was $2,341, and the amount collected was $1,508.22, showing a discrepancy between the two amounts of $832.78. The aggregate amount paid for damages to sheep was $315.94, and the amount on hand, belonging to that fund, is $1,019.85. The policy of the law under which this tax is levied was not supposed to be so much for the purpose of creating a large fund as for reducing the number of the canine race or "improving their manners." Whether the collectors of these taxes have performed their duty by killing the dogs upon which the tax was unpaid, is not apparent from the table below, but from the disparity between the amount *assessed* and the amount *collected*, with the collectors' fees thereon, it is very evident that there was remissness, either upon the part of the assessors or the collectors—of the assessors, in not properly taxing and describing the animals, or of the collectors, in not collecting the tax or killing the dogs.

On a reference to the *whole* law relating to the assessment and collection of the dog tax, it is found that any surplus of this fund remaining in the hands of the county treasurer more than one year is applied to the support of the poor, and under this wise provision, if people will insist upon keeping dogs, although with no sheep-killing propensities, and no damages are sustained thereby, the tax would seem to be very judiciously imposed and humanely applied to the support of the poor.

To carry out this provision in a more equitable manner, the board of supervisors of this county directed the surplus to be distributed for the temporary relief of the poor of the towns in which the tax was respectively collected.

The following is the state of the dog fund of the county of Saratoga for the year 1862:

TOWNS.	Assessed.	Collected.	Collectors' fees.	Losses paid out.	Balance.
Ballston	$72 00	$56 00	$6 60	$59 74	short 34
Charlton	85 00	72 00	7 20		$64 80
Clifton Park	130 50	101 00	10 10	8 00	82 90
Corinth	71 50	62 50	7 25	18 30	36 95
Day	72 00	63 00	7 30		55 70
Edinburgh	69 50	49 00	4 90	17 00	27 10
Galway	92 50	68 00	7 80	34 15	26 05
Greenfield	126 50	111 00	11 10	48 00	51 90
Hadley	52 50	41 50	4 15		37 35
Halfmoon	126 50	71 00	7 10	11 00	52 90
Malta	76 00	50 00	5 00		45 00
Milton	195 00	154 00	15 40	5 25	133 35
Moreau	72 50	46 00	7 60	17 00	21 40
Northumberland	56 50	47 00	5 70		41 30
Providence	56 50	54 50	5 40		49 10
Saratoga	144 00	82 00	17 20		64 80
Saratoga Springs	312 00	187 50	21 75	97 50	67 25
Stillwater	169 50	62 00	7 20		54 80
Waterford	297 00	62 72	6 27		56 45
Wilton	63 50	57 50	6 75		50 75
					$1,019 85
Less Ballston					34
Dog fund on hand March 18, 1863					$1,019 51

J. A. COREY, *Secretary.* H. A. MANN, *Treasurer.*

SCHOHARIE.

On the 15th, 16th and 17th days of October, 1862, a joint fair was held by the Schoharie County Agricultural Society and the Schoharie Valley Stock Growers' Association, at the village of Schoharie.

The time of holding the fair was late, in consequence of the want of time to complete the buildings in process of erection.

It has been the custom of the county society to hold its annual fairs alternately at Schoharie, Middleburgh and Cobleskill. Having no particular grounds at any place under its control, the society had adopted this plan with a view of accommodating those persons in these different localities, who felt an interest in its prosperity. Its managers having become convinced, by the experience of several years, that the interests of the society demanded a permanent location, where grounds could be properly prepared for its convenience, and in view of the fact that in consequence of the receipts falling short of the current expenses of the society, it was not in a condition to purchase or lease and prepare suitable grounds for its use at the present time, an arrangement was perfected and plan adopted, by the officers of the two organizations before mentioned, for holding a joint fair upon the grounds of the Stock Growers' Association, as stated above.

The exhibition was a creditable one, notwithstanding it rained a portion of the time each day, and the traveling was exceedingly bad. The display of cattle was not as large as we had had at some previous fairs, but it was very respectable in character. Some excellent sheep and swine were exhibited. The show of horses, probably, was never surpassed at any previous fair in this county. In the way of fruit, vegetables, and other farm products, the display was excellent.

The cultivation of the grape has been successfully engaged in by some of our horticulturists, and several fine varieties were exhibited, as well as a superior article of wine manufactured therefrom. In the manufacture of carriages and harness, Schoharie stands second to no county in the State, and fine specimens of these articles found a place upon the grounds.

The show of agricultural implements was not as extensive as might have been desired, yet quite a number of entries were made in that line.

The spacious hall in the building of the association was well filled with an endless variety of fancy and useful articles, paintings, needlework, etc.

In fact, every department of industry was represented well, considering the condition of the roads and weather.

Six hundred dollars were offered in premiums, besides books and diplomas. Three hundred and ninety-seven dollars were paid in cash premiums.

The terms upon which the two organizations united for the purposes of the joint fair of 1862, gave the members of the county society, upon the payment of one dollar each, the same privileges as were enjoyed by the members of the Stock Growers' Association, who under its regulations were required to pay five dollars membership fee. It was also further agreed that the fair should be managed by the officers of the association, the society not to be subjected to any expense, nor to receive any of the profits, if any, of the exhibition.

The officers of the Stock Growers' Association have kindly furnished me with a statement, including a history of its existence and present condition, which is as follows:

The Schoharie Valley Stock Growers' Association was organized under a charter passed by the Legislature of 1860. The corporators embraced some of the most prominent agriculturists and business men in the county. The first meeting was held in June, 1860, at which officers and trustees were elected and a code of by-laws and regulations adopted. Membership fee was fixed at five dollars, each member being liable to a tax of not to exceed one dollar in any one year, if required by the condition of the association and authorized by a vote of the board of trustees. There has been received, up to the present time, $1,465 for membership fees, and one tax has been laid of one dollar upon each member, in 1862. The association has leased for a term of twelve years, fifteen acres of ground, at a yearly rent of $175, upon which has been constructed a building 120 by 40 feet, two stories, the upper part being a large hall, and the ground floor being used for exhibition room and offices for the use of secretary, etc. The cost of the building was $1,500. A fine track has been made upon the grounds, and an appropriate fence built around the whole, which together cost $1,495. Sheds, stalls and pens have also been constructed for cattle, horses, sheep, swine, etc. The first annual fair of the association was held in 1861, and was a success, and notwithstanding the heavy expenditures of the association, the report of the treasurer at the annual meeting in June, 1862, showed a balance in hand. The following gives the present financial condition of the association, to wit:

Balance in hands of Treasurer, June, 1862	$49 74
Received from all sources since last report, including membership fee, admission to fair grounds in 1862, tax, etc	1,323 30
	$1,373 04
Paid for premiums at fair of 1862	$397 00
Paid other expenses of fair of 1862	216 60
Paid for improvements to grounds	436 99
Balance on hand	322 45
	$1,373 04

Officers, 1863: Tobias Bouck, President; A. B. F. Pond, Secretary; Charles A. Goodyear, Treasurer. TOBIAS BOUCK, *President.*

SCHUYLER.

The undersigned would respectfully report the following as the results of the transactions of the Schuyler County Agricultural Society for the year ending January 14th, 1863.

Owing to the distracted state of our national affairs, and the consequent withdrawal of so many of its most active members from the rural and mechanical branches of the community, the exhibition in the stock and mechanical departments was not as good as it was at our previous fairs, but what was exhibited was of a superior quality, and gave evidence of continued progress and improvement.

The receipts and expenditures were as follows:

Balance on hand from 1861	$274 96	
Amount received at fair	442 91	
		$717 87
Premiums awarded and paid	$261 83	
Premiums awarded and not called for	7 80	
Expenses and improvements on fair ground and buildings	196 53	
		465 66
Balance on hand		$252 21

Officers elected for the ensuing year are as follows: Timothy Owen, Hector, President; John W. Thompson, Watkins, Secretary; Thos. Evans, Watkins, Treasurer.

TIMOTHY OWEN, *President.*

SENECA.

My report to you this year is necessarily of the briefest character. Nothing has transpired in relation to agricultural matters in this county which would be interesting to the public generally. At the time our annual fair and exhibition was held, my health was too poor to admit of my being present but part of the time, and I was not able to see what was exhibited. A comparatively small portion fell under my observation, but what I did see, led me to form the opinion that the exhibition was nearly equal to the best we have had. I cannot see that the interest, with regard to the doings of the county agricultural society, has perceptibly diminished, although the exhibitions of two other societies were held last year within the county, and another within one mile of its border.

Since the death of Mr. Delafield no one in this county has taken a like interest in scientific agriculture. But the efforts which he made to develop the capacities of our soil, and improve it, did not die with him. He imported the first draining tile machine in the county, and labored to impress upon our farmers a conviction of its necessity. His labors in this respect were not thrown away, seconded as they were by the example of Mr. Johnston, in his immediate neighborhood. The machine which Mr. Delafield imported (still in existence in this county), has been superseded by one of a very superior character, owned by Mr. Abram Lattourette, of Waterloo, capable of grinding the clay for and making 10,000 2½ inch tile in one day. While, about fifteen years ago, but one machine, of limited capacity, was used in this county for making tile, there are now three large machines, capable of making from 25,000 to 30,000 tile, of 14 inches in length, daily, within the limits of this village. Some idea can therefore be formed of the increase of drainage in this vicinity, by the large increase in the manufacture of tile.

At the annual meeting of the society the following persons were chosen officers: O. W. Wilkinson, President; William Dunlap, Vice-President; Charles Sentell, Secretary; John D. Coe, Treasurer.

The following is a statement of the receipts and expenditures of the society for the past year:

Receipts, including balance in treasury	$1,618 59
Expenditures	1,166 30
Cash in treasury	$452 29

At the annual meeting, premiums were awarded for the best crops of grain, roots, seeds, &c., and also some premiums on butter. The following are the awards:

GRAIN, ROOTS, &C.

Best acre of winter wheat, 42⅞ bushels, M. B. Ritter, Varick	$5 00
Best acre of barley, 49¼ bushels, do do	5 00
Best ¼ acre of beans, 16 bushels, M. Hoster, Fayette	2 00
For the largest quantity of good Timothy seed per acre, 5¼ bushels, M. B. Ritter, Varick	3 00
Best ¼ acre of carrots, 46¼ bushels, J. D. Coe, Romulus	3 00
Best ¼ acre of beets, 104 do do do	3 00
Best ¼ acre of potatoes, 110 bushels, L. Hoffman, Junius	3 00

BUTTER.

Best butter, entered by Israel Lisk, Junius	4 00
2d best do do do	3 00
3d do J. D. Coe, Romulus	2 00
4th do L. Hoffman, Junius	1 00

Among the entries for the premium on wheat, was one by P. P. Howe, 37⅛ bushels per acre.

CHAS. SENTELL, *Sec'y.*

STEUBEN.

In presenting the tenth annual report of the Steuben County Agricultural Society, it is interesting to notice the meteorological features of the season, as affecting the crops and fruits, and also the tillage of the soil, as resulting in improved or depreciated production.

The last winter was noted for heavy snows, which fell to a great depth, keeping the ground covered until April; the melting away of which filled the streams, and saturated the ground to an unusual extent. This prevented early tillage, and compelled the farmer, who had not "fall plowed," to delay that service until May, and consequently the seeding was not finished before June.

The summer was unusually dry; not a rain fell to fill the springs, or to saturate the ground. The following meteorological table will give the quantity of rain during the season:

From May 4th to June 16th, rain fell only 0.83 inches; from June 16th to 23d, one inch; to 28th, one inch more.

On the 8th of June there was a frost which injured the crop of timothy, causing it in places to stop growing and not to head out. Rain in July, first week, 2.23 inches; second week, 0.56 inches; fourth week quite wet, three inches of water fell.

During the month of August not more than one inch fell. September was also a dry month; 1.25 inches of water fell. On the 3d day of September, frost, which killed the corn in many places.

October, first week, 0.64 inches of water fell; second and third week, 0.25; fourth week was a stormy week, rain every day, killing frosts, snow squalls, and on 26th and 27th snow and rain, forming ice on trees, breaking them down, and causing great injury. November 7th, snow covered the ground two inches; the 15th the coldest day of the season, temperature at 26° and freezing fast. December 6th, also a cold day, wind north, freezing all day.

The mean temperature for the year was as follows: December, 29 deg.

05 min.; January, 25 deg. 09 min.; February, 24 deg. 50 min., equal to 26 deg. 21 min. for winter.

March, 32 deg. 76 min.; April, 43 deg. 10 min.; May, 52 deg. 25 min., equal to 42 deg. 70 min. for spring.

June, 60 deg. 72 min.; July, 68 deg. 64 min.; August, 68 deg. 16 min., equal to 65 deg. 85 min. for summer.

September, 64 deg. 47 min.; October, 52 deg. 16 min.; November, 37 deg. 05 min., equal to 50 deg. 89 min. for autumn.

The hay crop was good, except on old meadows, where the June frost and the influence of the drought shortened the crop. The clover crop was quite good. Altogether, the hay crop was not a full average.

The winter wheat yielded finely. It was not affected by the midge or aphis, but the spring wheat was much injured by the latter. This insect appeared in numbers just as the earlier spring wheat was in bloom, and gradually disappeared as the late sown approached to bloom. The former was seriously injured, the latter but little. The crop, altogether, was far short of an average.

But a small area of barley was sown, and that quite late. The yield in some places was a full average. In the western part of the town of Prattsburgh, and in Cohocton, some very fine crops were raised. Also in Avoca and Bath. They who delayed the marketing of their barley realized from eight to ten shillings per bushel.

Oats are extensively raised in the county. The demand this autumn was good, ranging from forty to fifty cents. The average product was fair, probably thirty bushels per acre. It is deemed an excellent crop, as the straw, when housed in good condition, is valuable for fodder—preferable for horses to hay, as the latter induces heaves.

Indian corn was not very productive in some parts of the county, owing to the frost in June and in September. In the valley of the Cohocton, Canisteo and Tioga the crop was very good. In all the county it was not a full average.

Buckwheat was sown in considerable quantity, being considered a good crop for late tillage, and to rid the land of weeds and thistles. It is usually sown about the first of July. The average yield the present season was less than usual, not more than fifteen bushels per acre; the price fifty cents per bushel.

Potatoes were very good, and were free from the rot. The new variety called the Peach Blow were unusually large, and prove to be very reliable. The Purple Chilis are a fine late variety—keep sound and crisp until the new crop comes in. The yield in the county would average about 160 bushels per acre.

Peas and beans were very productive. The pea denominated the Black Eyed Marrowfat was particularly productive, yielding full fifty bushels per acre. We regret that these crops do not receive more attention, as they are good paying crops.

The fruit crop was unusually large. Apples, pears, peaches, plums, and all the smaller fruits, were in full bearing, and the exhibition at our county fair was very select.

The injury to the crops generally, by the frost and the drought, has been

quite marked; that of the hay and grass full one-quarter, and the cereal crops, by the aphis, full one-half.

The annual fair was held in Bath, on the 24th, 25th and 26th days of September. The attendance was unusually large, and the receipts greater than on any former occasion. The entries were quite full, and in quality creditable to the county. The premiums were awarded to merit alone, and they were in all cases adjusted according to excellence and intrinsic worth, and not so much to relative value as in former exhibitions. By this arrangement many inferior articles were thrown out, to the disappointment of their exhibitors, but all that were superior in quality and grade were awarded the highest premiums.

IN DURHAM CATTLE.

Best Durham cow, to J. C. Robies, of Bath.
Best Durham heifer, to Monroe Wheeler, of Urbana.
Best Durham bull, to William Braisted, of Howard.
Best Durham yearling heifer, to Samuel Crouch, Cohocton.

IN DEVONS.

Best bull, O. F. Marshall, of Wheeler.
Best heifer, O. F. Marshall, of Wheeler.
Best cow, Charles Waldo, of Prattsburgh.
Best grade cow, Gilbert Townsend, of Bath.
Best grade heifer, John Richardson, Bath.
Best pair of steers, Samuel Balcom, of Campbell.
Best pair of working oxen, O. F. Marshall, of Wheeler.
Best pair of draft oxen, Samuel Balcom, of Campbell.
Best three year old steers, Charles Waldo, of Prattsburgh.
Best milch cow, James H. Willam, of Bath.

SHEEP.

Best fine wool buck, Hozea Longwell, Bradford.
Best three buck lambs, John Richardson, Bath
Best five ewes, Myrtle & Ackerson, Bath.
Best exhibition in fine sheep, Myrtle & Ackerson, Bath.

HORSES.

Best farm or draft stallion, Daniel Towner, Avoca.
Best mule, Albert Clark, Prattsburgh.
Best jack, Stephen Clark, Prattsburgh.
Best matched horses, Addison Wheeler, of Wheeler.

DAIRY.

Best butter, firkin, C. Demarest, Avoca.
Best cheese, C. H. Young, Bath.

FARM PRODUCTS.

Best bushel of winter wheat, A. Brundage, Urbana.
Best bushel of spring wheat, C. Demarest, Avoca.
Best acre of hay, three tons and 510 pounds, to B. F. Balcom, of Corning.
Best sample of rye, R. Simmons, of Urbana.

IN NEEDLEWORK.

Best fine shirt, and best specimen in plain sewing, to M. E. Carter, of Bath.

Best embroidered child's sacque, Mrs. A. J. McCall, Bath.

Best crotcheted table mat, Mrs. Ellen McGee, Bath.

FANCY ARTICLES AND FLOWERS.

Best variety of flowers, Mrs. Dr. Cruttenden, Bath.

Best vase of flowers, Miss Louise Cheney, Prattsburgh.

Best oil painting, Miss Jennie DeWolf, Bath.

Best crayon drawing, Miss Clark, Urbana.

Best essay on birds, A. B. Case, of Howard.

The receipts and expenditures for the year were as follows, viz:

Receipts for members, and entrances at the fair		$1,198 83
Donations from Pultney and Johnston estates		75 00
Received from the State, December, 1862		172 00
		$1,445 83
EXPENDITURES.		
Payment of balance of debt on fair grounds	$453 51	
Printing and expenses of fair	410 82	
Premiums paid and to be paid	520 40	
		1,384 73
Balance		$61 10

G. DENNISTON, *President.*

PRATTSBURGH, *December* 5, 1862.

SULLIVAN.

In submitting the statistics of Sullivan county, a few remarks in relation to the soil, timber, general face of the county, occupations of its inhabitants, and crops of 1862, may not be without interest.

The soil on most uplands in the towns of Thompson, Fallsburgh, Liberty, Callicoon, Bethel, and a part of Cohocton, is what is denominated among the farmers of the county as red slate, and produces much the best crops of rye and corn; in fact it is the only soil upon our old improved farms, except occasionally a ridge of gray slate, that can be devoted to these crops with any degree of success. As you descend the slopes of the ridges the soil usually changes to a loam and becomes more shallow. Especially is that the case when facing west. The soil of the flat lands partakes of the alluvial character of all valleys. Many of the lands above described, when first cleared and new, produce fine crops of winter grain, but are not to be relied upon after long cultivation. Our farmers usually devote their loamy and flat lands, if not to pasturage and meadows, to the summer crops. The timber in the towns above named is principally maple, beech, birch and hemlock, on the ridges, and spruce, white maple, ash and some pine in the low lands and swamps. The remaining towns of the county partake in some parts of the character, as regards timber and soil, of those above named, but as a general thing the soil and timber are different, the soil being gravelly or clayey, timbered with oak, chestnut, hickory, pitch and white pine, etc. The surface of the county is rolling. On

the east the Shawangunk mountain runs through the town of Mamakating, and in some of the other towns the hills assume almost the character of mountains. As a natural consequence, the county abounds with excellent mill sites, which have been and are well occupied with tanneries and mills of various kinds. The business of tanning and lumbering has occupied the time and capital of a large portion of the people of the county, and as a consequence agriculture has been in a measure neglected. But in several of the towns the forests to a great extent have disappeared, and the people are being compelled to resort to agriculture as a means of living, or of emigrating elsewhere. This remark applies with peculiar force to the towns of Lumberland, Highland and Tusten, which formerly were covered with the finest groves of pine and oak, and were the very paradise of the lumberman, but now have almost entirely disappeared, and their places, to a large extent, occupied with scrub oaks, whortleberries, etc. Nevertheless, the soil of these towns, when susceptible of cultivation, is good, fully equal to that of other parts of the county, and but needs the application of labor and capital to develop fine farms, as, in fact, there are many at the present time.

In scarcely a single town of the county is the attention of the inhabitants wholly devoted to agriculture, some tanning or lumbering being still carried on, to the neglect of the soil. By reference to the statistics of the county it will be seen that eastern and central towns are the most engaged in producing the various grains, with butter and pork, while more cattle are raised in some of the western.

Scientific farming in this county is scarcely begun. Under-draining, sub-soil plowing and kindred improvements are but just beginning to attract the attention of our people. Yet I am fully persuaded that in no county of the State would the adoption of a more improved system of farming pay better.

No county produces better butter or gets better prices for its grain, beef and pork. Still our farmers seem slow to branch out into anything new. Any extra effort, even to create and preserve a good supply of manure (the farmer's main brace), in almost every instance is wholly neglected. Witness if the footing up of some whole school districts does not make an amount that should be produced by a single farmer. Instead of conveying water to the barn yard, as I noticed in numerous instances could be easily and cheaply done, and the cattle confined in winter and manure saved, I observed in my perambulations through the county the reverse to be the fact. The cattle went to the spring or stream to drink; consequently much of their manure was lost. Now this is all money, and I would advise the farmers of Sullivan county and of the State of New York, if they can convey water from a spring or stream to their cattle yards, to do so at once. If they cannot, to dig a well and pump the water into a trough for them. By so doing you will save much manure scattered about the fields and wasted. My experience is, after long trial, that it pays.

The poor exhibit of crops in this county for 1862 (notwithstanding our careless manner of farming) is in a great measure to be charged to the unfavorable season, insects, &c. I notice in many reports from school districts that corn and buckwheat were killed by the frost and injured by wet

weather, and that wheat and oats were partly destroyed by insects, &c., &c. The average yield of various crops in Sullivan for the year 1862, as a consequence, is much below that of former years.

In conclusion, I would add that no branch of industry receives less protection and encouragement than agriculture from our government, and, as a class, the farmers should not complain, for none second what is done for their benefit with less earnestness. Witness the appropriation by the State for the encouragement of agriculture is lost to a large number of the counties in the State, simply because the farmers do not take a sufficient interest in their own advancement to organize and sustain a county agricultural society. And again, would the effort on the part of the State to diffuse useful information to a large number of persons, asking but trifling return, be likely to be any more appreciated by many? Had it been otherwise, I should not have been obliged to submit to the mortification of reporting the statistics of Sullivan county with so many school districts blank, yet, I am pleased to say, much the largest number performed the work promptly, and certainly meet the promised reward.

C. HATCH.

In this county there is no organized society. The statistics were taken as fully as they could be secured in the time allotted, and will be found among the statistics of those counties which have reported.

TIOGA.

Our annual fair was held in the village of Owego, September 23, 24 and 25, under very unfavorable circumstances indeed, from the fact that our country is and was in such a state, caused by this wicked rebellion brought upon us by the obstinacy of our southern brethren; and so many of our athletic farmers had gone to the war that it was with many doubts and misgivings that we held our fair at all, but you will see by the report of our treasurer, that we had a perfect success, and got out of debt and left a small balance in his hands. Something new for us. We had good weather, and a better attendance of farmers, with their wives and daughters, than was expected. We had a very fair exhibition of all kinds of stock, and the usual interest seems to be well kept up. We hope another year to be able to report a larger amount of receipts and exhibition. With the best wishes of our society for your health and prosperity, I remain,

Yours, DAVID TAYLOR, *President.*

TIOGA, N. Y., *January*, 1863.

ULSTER.

In answer to your letter, dated in April last, and asking for information in regard to the state of agriculture in the county, the crops most cultivated, &c., &c., I reply as follows: Ulster is not exclusively, nor indeed mainly, an agricultural county; there are various other interests which, together, employ more people than the cultivation of the soil. The northeastern part of the county has numerous quarries of flagging stone, and also of cement, which give employment to hundreds of workmen. The

northwestern part is mountainous and well covered with forests, mostly of hemlock, which draw thither great numbers of tanners and lumbermen. The Delaware and Hudson canal, which passes through the county, also takes many of our young men from the farm. Only in the southeastern part of the county do the agricultural products raised exceed in value those consumed. Hay is the principal crop of Ulster county; in many places its value exceeds that of all other crops combined, and more of it is raised every year. Most of the hay sold is pressed and sent down the river to New York. Hundreds of tons, however, are sold at places on the canal to the boatmen for the use of their horses. Within the last ten years hay has become the most important crop, as the cost of raising is less per acre than that of any kind of grain. The value of the crop is usually greater, and the injury to the soil is less. Most meadows need plowing, re-seeding and a good coat of manure once in six or seven years. Timothy hay, although not the best for home consumption, sells best in the New York market. The average yield is about two tons to the acre, and the average price of good hay $15 to $20 per ton.

Pork, beef and grain were formerly exported to a great extent; our farmers have become convinced, however, that we cannot successfully compete with the fertile West, except in the production of such articles as cannot be transported by railroad; accordingly, but little breadstuffs or provisions are now raised, except for home consumption. A few farmers, however, make a practice of buying a number of cattle each year, when the market is dull, fattening them for a few months, and selling them when the market is better.

Sheep are kept in the southern part of the county, and they are thought to pay better than any other kind of stock. Few sheep are raised here. Farmers sell the lambs, and the sheep also, when they become too old to thrive well, and depend for a new supply on the droves which are brought out every fall from the West. The lambs have been heretofore the chief source of profit, as they sell readily, either to the home butcher or in the New York market, at from $3 to $4 a piece, when five or six months old. By the recent advance in the price of wool, and the passage of the bill imposing a tax on dogs, sheep raising will become much more profitable than formerly.

Some butter is made for sale in almost all parts of the county, and in one or two towns large dairies are kept. Butter making, however, is rather on the decrease, most persons supposing it to be less profitable than some other branches of farming.

Fruit culture is receiving increased attention, and is becoming an important branch of agriculture. The soil and climate of Ulster are well adapted to fruit raising. Many orchards have been set out within the last few years. The crop this year has been excellent, but prices have scarcely proved remunerative.

Within the last few years the culture of berries, especially of the Antwerp raspberries, has been introduced, and is now carried on to a great extent in some sections near the river. Scarcely any idea can be formed by a stranger of the quantity of berries sent down the river during the few weeks while they are in season.

The culture of the vine is beginning to receive attention, and it is quite possible that Ulster may yet be a wine-producing county.

The state of agriculture in the county is improving. Our farmers are exhibiting a commendable spirit of enterprise. Swamps are being cleared up, bush rows cut down, underdrains constructed, and substantial fences erected. New and improved farm machinery is very generally used. In most parts of the county the residences of the tillers of the soil, and their outbuildings, present a much more creditable appearance than they did ten years ago. Former residents of the county, after having been absent for a number of years, almost always remark upon the improved appearance of the county. Farmers are learning to cultivate the soil intelligently, and to honor their calling. Agricultural books and papers are much read.

The county agricultural society is in a flourishing condition; it has selected a permanent site, and erected buildings for the use of the society.

Officers 1863: J. P. Myers, President; A. Schoonmaker, Jr., Cor. Sec'y; William Townsend, Treasurer.

JOSIAH P. LEFEVER, *President.*

WARREN.

Extract from Report of Executive Committee.

The sixth annual fair and cattle show of the Warren County Agricultural Society was held on the society's grounds, at French Mountain, on the 24th, 25th and 26th days of September, 1862.

The following comparison exhibitits the entries for different years in all departments:

	1857.	1858.	1859.	1860.	1861.	1862.
Aggregate.....	74	277	340	571	600	704

The committee cannot refrain from expressing their admiration and surprise at the display of Spanish Merino sheep at this fair. We know they far exceed anything heretofore exhibited at any show in this or the adjoining counties, and would not fear comparison with any counties in Vermont.

APPLES.—Mr. Robert Gilchrist exhibited two hundred varieties of apples. Among the grafts were Talman Sweeting, American Golden Russet, Roxbury Russet, Rhode Island Greening, Common Greening, Newtown Pippin, Waxen Apple, Swar, Fall Pippin, Golden Sweet, Northern Spy, Newark Cider Apple, Wine Apple, Siberian Crab, Harrington Seedling, &c., &c. The Seedlings are of many finely flavored varieties, and are sweet, tart or spicy, juicy and crisp good-sized apples for fall or winter use. Mr. Gilchrist having selected upwards of two hundred different kinds from his trees, states that apple trees in numbers are found growing spontaneously in the fields and in the forest, and on open spots to the mountain tops, bearing abundantly good sized and highly flavored fruit of great variety. Hence, the apple, if not of indigenous growth to the county of Warren, its soil and climate are so genial and well adapted to it, that in time the growing demand will induce a more skillful attention as well as a more extensive culture of the apple in this county.

A brief Statement in Relation to some of the Agricultural Interests of the County.

The agricultural interests are increasing in the county, and the farmers are getting awake to their importance. The soil of land is not of the richest quality, but rather light, though warm and quick, and is well adapted to most crops raised in other parts of the State. With good farming, the farmer is sure of a good crop, if the season is favorable. Late frosts in the spring and early frosts in the fall occasionally destroy the hopes of the farmer in this county. As far as Indian corn, buckwheat, beans, late potatoes and vines are concerned, that has been the case last season. The corn crop, the great staple of our county, which never looked more healthy and encouraging for an abundant harvest, was almost universally cut off by the frost; probably we may except the town of Queensbury. The same with buckwheat, which has become a very important crop. Potatoes and beans were very much injured, and vines shared the same fate. Indian or summer buckwheat (commonly called with us Indian rubber buckwheat) is raised to a considerable extent in this county, which matures before the frost, and is considered a profitable crop, which generally weighs about 50 pounds to the bushel, and yields from 40 to 50 bushels per acre, and is used for family use to some extent. It is a very good substitute for corn and oats for feeding horses, and, when ground and sifted, is an excellent feed for fattening hogs and cattle. The bran is merely hulls from the grain, which makes good bedding for horses and cattle, and then makes good manure. Spring wheat has been successfully raised for a number of years, and still that was a failure the last two years on account of the fly, though not so bad last season. It is to be hoped the farmer will take new courage, and next spring double his amount of sowing; and when well put in and cared for, he may confidently hope for a good crop. The hay crop was not quite so good as usual on account of the long dry season. The ruta baga and carrot crops were good as usual, and raised to a considerable extent, and will do much to supply the deficiency of corn, potatoes and hay.

Most of the land in this county is well adapted to grazing, consequently many horses, cattle and sheep are raised, and although the last season was very dry, yet the cattle and sheep had good pasturing, and came out in the fall in good condition.

The Warren County Agricultural Society has had something to do in stimulating many of the farmers to excel in raising crops and stock. The show at the last annual fair was not quite as large or good as the show for the last three annual fairs, probably in part in consequence of the distracted state of our once happy country, and part from the failure in so many crops, and in part from the removal of the fair to another location, though the new location is as good as any other in the county.

An excellent address was delivered by James H. Brisben, Esq., which was listened to with much attention, and has been published for the benefit of the farmers of Warren. WILLIAM H. WELLS, *Treasurer*.

WASHINGTON.

In consequence of the war matters, no annual fair of the Washington County Agricultural Society was held last year. Inclosed please find list

of officers for 1863. Several premiums were awarded at the annual meeting of the society, and the time for holding the fair for 1863 was fixed for the 9th, 10th and 11th days of September, at Salem, where it is to be permanently located for ten years, and buildings for that purpose have been completed and are ready for use. The prospect for the next fair is good.

Officers for 1863: President, William M. Holmes, Greenwich; Recording Secretary, R. K. Crocker, North White Creek; Assistant Secretary, Orrin Austin, Salem; Corresponding Secretary, Milo Ingalsbee, Hartford; Treasurer, S. W. Crosby, North White Creek.

R. K. CROCKER, *Recording Secretary.*

WESTCHESTER.

The eighteenth annual fair of the Westchester County Agricultural and Horticultural Society was held on the 23d, 24th and 25th days of September, 1862, at Fordham, town of West Farms, on the farm of Charles W. Bathgate, Esq. The grounds were extensive, embracing a half mile track or course, prepared in a superior manner, in the center of which was an elevated wooded knoll, from which a full view of the entire course could be had. That portion of the grounds appropriated for floral hall, cattle sheds, &c., was separate from the course, and was inclosed by a high and substantial fence. The arrangements in this inclosure were not, from the inexperience of those in charge, as ample as could have been desired, and some delay and confusion were unavoidably created in their enlargement. Nevertheless, the entire accommodations did great credit to the liberality of Mr. Bathgate, who spared neither labor or expense to give satisfaction to the officers of the society, and insure the success of the exhibition. The entries on the first day were somewhat embarrassed by the necessary enlargement of the accommodation for their reception, but on the second day there was a splendid exhibition of horses, neat cattle, fruits, flowers and vegetables. The show of horses has never been equaled, nor of native or blood neat stock surpassed by any previous exhibition.

The track and its shady knoll were the great centers of attraction, and thousands of delighted spectators spent the greater part of the time in witnessing the performance of the competing animals, whose beauty, blood and speed could not be surpassed in any part of the State. The premiums offered in this department were liberal, and the awards nearly exhausted the entire appropriations.

In neat cattle there was a fine show of native and crosses, many of them very superior animals, and comparing very favorably with the blooded stock. In the latter class were some of the finest in the county. In Durhams, Messrs. Peter Lorillard, J. &. A. Bathgate and Francis Morris were the most successful competitors; in Devons, Messrs. Samuel Faile, John C. Jay and Mrs. Alex. Bradford; in Ayreshires, Messrs. Wm. Bech, Hugh Lunny, and John C. Jay; in Alderneys, Mrs. H. C. Baretto, Edward G. Faile, John Van Antwerp and James Lees. The show of animals in the last class was very fine; and in view of the high character they are acquiring for their many excellent qualities, the board of managers for the first time decided on putting them on the same footing as other blooded stock, and awarding them similar premiums.

Amongst the novelties in stock were several animals of the Brittany or Channel Island breed. They attracted great attention, and were very much admired.

The show of sheep and swine was small, but good. Working cattle were greatly in the minority, but obtained high praise for their superior quality.

Poultry formed an interesting feature of the fair, and greatly surpassed the exhibition of last and some previous years. It is to be hoped that this interesting department will continue to improve.

In field crops there were but twelve competitors. The inattention of farmers to these objects of competition is greatly to be regretted, as showing an indifference to one of the main objects of the society. The premiums offered are sufficient to pay successful competitors for any extra skill or labor they may expend, to say nothing of compensation in increased crops. The few entries made show that with reasonable attention to field labor, Westchester county could compete with any other in the State in cereal or root crops. The first and second premiums for wheat were awarded for 31 8-32 bushels to the acre, weight 66 lbs. per bushel, and 25 bushels to the acre, weight 66 lbs. per bushel. For corn, for 109 31-32 bushels, weighing 56¾ lbs., and 85 7-12 bushels, weighing 58 lbs. per bushel. The first premium for potatoes was awarded for 283 12-32 bushels per acre. A. Mead Clark, of Bedford, was the successful competitor in all the above. Dr. Underhill took the first premium on carrots, for a crop of over 600 bushels to the acre, and Jared Hoyt, of Rye, received the diploma of the society for a crop of onions equal to 1,000 bushels to the acre.

The mechanics' department was not as fully represented as in former years. Agricultural implements, of the most approved construction and superior workmanship and materials, made a handsome show. They were contributed chiefly by manufacturers and dealers.

The exhibition of fruits, flowers and vegetables was extensive and varied. The show of fruit surpassed that of any previous year. Grapes were a special feature in this department, comprising several new and approved varieties. Pears and apples were in great abundance, of almost every known variety and of excellent quality. Domestic wines of several kinds were on exhibition, and some of them highly approved. As the society now offers premiums for these wines, it is probable they will be fully represented at future fairs.

The floral display was not large, but good; comprising some very choice flowers, and pleasing combinations of flowers, showing great taste and artistic skill in their formation.

Before the premiums were announced, the Hon. A. B. Conger delivered an eloquent and instructive address to a pleased and attentive audience, and received the thanks of the society; and then, after list of awards had been read, the 18th annual fair was declared closed.

The amount of money premiums offered was $991; books 144; diplomas 17. Awarded $712; books 86; diplomas 14. The receipts were a little over $1,100.

The result of the exhibition has been satisfactory, and affords encouragement for renewed efforts to carry out still more successfully the laudable objects of the society.

Officers 1863: Simeon Leland, President; John Cowan, Recording Sec'y; James Wood, Corresponding Secretary; James Armstrong, Treasurer.

SIMEON LELAND, *President.*

WYOMING.

The annual meeting of the society was held January 13th, 1863.

Report of the president and treasurer of the state of the funds of the society:

Receipts from all sources	$754 97
Payments	578 57
Balance on hand	$176 40
Due the society	$1,574 00

An examination was had of fruits, wine and grain on exhibition. A. Bradt exhibited 12 varieties of winter apples, and Mr. Capwell 14 varieties of winter apples, 7 varieties of grapes, and 3 varieties of native wine. J. M. Quale exhibited a seedling apple, which was named by the executive committee "Wyoming County Seedling." A specimen of black variegated seed oats was exhibited. A copy of the "American Agriculturist" was presented to Mr. Bradt and Mr. Capwell for winter apples, and a diploma to Mr. Capwell for wine exhibited.

Officers for 1863: Ephraim Wheeler, President; Thomas J. Patterson, Vice-President; H. A. Dudley, Secretary; T. H. Buxton, Treasurer.

DUNCAN CAMERON, *President.*

YATES.

The annual fair was held on the 9th and 10th of October, and was very well attended. The show of animals, fruit, &c., was very good; in the domestic department not a large display.

The receipts, including balance at the commencement of the year ($216.64), were $896.88; payments $535.36; leaving a balance of $361.52.

Officers for 1863: George Wagener, President; W. S. Judd, Secretary; Benjamin S. Hoyt, Treasurer, with board of managers.

W. STEWART JUDD, *Secretary.*

TOWN AND UNION AGRICULTURAL ASSOCIATIONS.

It is a matter of great regret that so few of these societies have made reports of their proceedings, other than the statement of their receipts and expenditures, to the Comptroller. Most of the societies suppose that this is all that is required. In addition to these reports, each society is required to make a report to the State Agricultural Society of their proceedings. A few of the societies have done this, and we would call the attention of all the societies to the reports from the Vernon Agricultural Society, Farmers' Club of Little Falls, Skaneateles Farmers' Club, Middlebury Agricultural Society, and Dryden Agricultural Society, and the first annual report of the Delhi Agricultural and Mechanical Association, Manlius and Pompey Agricultural and Mechanical Association, and the Palmyra Union Agricultural Society. These reports indicate what might have been done by all the societies. It is true that in the present state of our country many of the societies have been unable to hold their usual annual exhibitions, but all of them could have carried forward their monthly meetings for discussions, in which much that would have proved beneficial to them would have been secured, and the publication of their proceedings would have proved a stimulus to others to make like efforts. We would urge upon each and all of these associations to make renewed efforts for the improvement of the particular field of their operations, and furnish to the State Agricultural Society a full and complete statement of all their operations.

TOWN AGRICULTURAL ASSOCIATIONS.

Afton, Chenango County.

The fourth annual fair and cattle show of the Afton Agricultural Society was held on the 18th and 19th of September, 1862, on the fair ground of the society in said town. The first day of the fair being rainy, the entries in consequence thereof were not so numerous as they otherwise would have been, nor the receipts as large.

The show of cattle, horses and sheep was good, and of the full bloods and grade cattle there were some of a very superior quality.

Of horses a few were very fine, matched and single, mostly four year olds and under.

A very good show of sheep. Swine, only a few on exhibition.

The exhibition of fruits and vegetables was highly respectable, but not much competition.

The display of manufactured articles, in the ladies' department, was exceedingly fine but not large.

An able address was delivered on the second day of the fair, by Mr. John Shattuck, a practical farmer, of Chenango county.

Officers, 1863: Stanton F. Donaghe, President; G. H. Champlin, Secretary; J. C. Chamberlin, Treasurer.

G. M. THOMPSON, *Secretary.*

Barton.

Society was organized in 1861. The first annual meeting of the society was held in April, 1862, and by-laws and regulations for the society were adopted.

The following officers were elected: Abram Westbrook, President, Barton; Benjamin G. Rise and Joshua S. Holbert, Vice-Presidents; James S. Murray, Secretary; Thaddeus Whitaker, Treasurer.

The amount of receipts, including balance in treasury, was $1,037.46; amount of payments $643.76; balance in treasury $393.70.

JAMES S. MURRAY, *Secretary.*

Constantia, Oswego Co.

The fifth annual report of the society gives the proceedings at their annual fair, which were in all respects creditable to the farmers and ladies of Constantia, considering the great efforts which had been put forth in sending volunteers to the war.

The fair was held on the 11th and 12th of September. The entries were not as large as in previous years, but nearly every department was well represented by articles of decided merit. The town fair is above all others of interest to the farmer—where neighbor may confer with neighbor upon the merits of articles of interest to themselves.

The amount received during the year was $108; expenditures, $98.32; balance, $14.68.

Officers for 1863: W. P. Dickinson, President, Cleveland; Levi Belknap, Vice-President, Bernhard's Bay; James Dickie, Secretary, Bernhard's Bay; R. McFarland, Cor. Secretary, Constantia; Stephen Taft, Treasurer, Bernhard's Bay.

JAMES DICKIE, *Secretary.*

Dryden, Tompkins Co.

The report of our society, which was to have been made by February 1st, has been delayed by the neglect of the ex-secretary, who removed from this vicinity without making the report, which it was his duty to do. I have just learned his neglect, and have made the report in haste, without any guide except some old reports in agricultural statistics, and hope I have complied with the requirements of the law, having just been elected secretary, and not having had time to examine it. I hope we shall not be the losers by this delay.

This exhibition of the society, as compared with others, showed a continued improvement in interest, attendance, and in the number and quality of the articles exhibited.

The weather was fine, and the fair as a whole was a decided success, the aggregate receipts reaching nearly to $1,000, the surplus of which,

after paying premiums and contingent expenses, enabled the society to remove the remainder of all the indebtedness incurred for the purchase of eight acres of land, and the erection of a decagon building, 80 feet in diameter and two stories high, and costing $3,500, in 1857.

Latterly, two fairs have been annually held in each year. One in May, free to all, for the exhibition of agricultural implements and breeding animals, also for the sale of all kinds of farm produce, and is productive of much good.

The regular annual fair was held October 9th and 10th, and much fine stock was exhibited. The show of horses was very fine, showing a steady improvement, especially in roadsters, and which may be, in time, to the detriment of good farm horses, speed only being developed, without a due regard to heft, strength or endurance.

Many fine thorough-bred cattle were also exhibited, both Devons and Durhams, with several fine pairs of working oxen, and a pair of extra fine fat steers. Durhams exhibited by J. Albright, Esq., attracted much attention, and would honor any State fair.

The show of coarse-wooled sheep was large and excellent, that of fine-wools small; but a very decided interest is being awakened, and much improvement may be expected.

The domestic and ornamental department certainly did much credit to the ladies, they having here, as elsewhere, done their part well, and added much to the interest of the fair.

The annual address was delivered by M. Goodrich, Esq., and did him much credit.

We find, therefore, much to encourage us. With our membership increasing, all incumbrances removed, and a small surplus, we are firmly established, and look forward to a long period of much usefulness to the agricultural commnnity of this vicinity.

SIMEON SNYDER, *Secretary.*

Galen, Wayne County.

The Galen (Wayne Co.) Town Agricultural Society held its annual meeting at the town hall, in Clyde, on 14th March, 1862, when Hon. L. S Ketchum was elected President; Lewis B. Parsons, Vice-President; Thomas Plumtree, Treasurer; Joseph Watson, Secretary; Albert Devereaux and Israel Roy, Executive Committee for three years.

J. T. Van Buskirk continued Librarian; library in good condition and many books out; some books added. Resolved to hold a fair at our town hall the coming fall; one man from each school district in town, who has taken the agricultural statistics for 1862, in his district, was made an honorary member of the society for the year, as an expression of appreciation for their valuable services in aiding to accomplish this project, so essential to a true knowledge of the progress of our great State.

Next annual meeting to be held on first Saturday in January, 1864, when we hope to receive from our town all the agricultural statistics for 1863.

JOS. WATSON, *Secretary.*

Ithaca Farmers' Club.

Our club has entered upon its fifth year, with encouraging prospects for its future increase of usefulness.

Our library, which reaches some 2,000 volumes of books, 1,200 pamphlets, is becoming better known among our farmers, who are embracing more frequent opportunities to consult their pages for special information, and are not unfrequently found examining our shelves for general information.

Our museum is increasing in the number and value of its articles of use and curiosity, as well as its specimens of seeds and grain, and bids fair to win a large share of popular favor. We have nearly a thousand specimens in our collection, among which may be found specimens of grain from a dozen of our States and several of the European governments. Among articles of interest in our collection at this time, June 30, is a specimen of the "Noe wheat, from France," sent out from our Patent Office, that is swarming with insects in the form of a small lead colored fly, quite slim, and half an inch in length; also a specimen of "Spelt, from Germany," which has produced a fine crop of the weevil, active and enteprising little fellows, one-fourth of an inch long, as black as "Tony," and decidedly restless under confinement; but we cannot consent to let either pass beyond the limits of the glass cases which confine them.

Farmers who drop in are much interested with the exhibition, as it illustrates to them how insects can be imported from foreign countries, and enables them to appreciate the favors that have been bestowed upon them by the seed department of the Patent Office.

Although we see less progress making in agricultural improvement than we like, we still feel justified in reporting a degree of progress from year to year among our farmers.

Hoping that our humble efforts may result in stimulating a greater degree of activity in the agricultural element that surrounds us, we shall press forward with unabated confidence in the future.

Yours, respectfully,

EZRA CORNELL, *President.*

Jefferson, Schoharie County.

The number of members, for the years 1862 and 1863, is sixty-eight. The society held an annual fair in September, which, in attendance and the interest manifested on the part of members and the public, was a decided success. The society received from the State twenty-nine volumes of books, which were distributed as premiums. The receipts were $83.29; expenditures, $74.28. The annual meeting was held January 28, 1863.

Officers for 1863: James T. Treadwell, President; Stephen J. Tyler, Secretary; James H. Merchant, Treasurer.

STEPHEN J. TYLER, *Secretary.*

Annual Report of the Farmers' Club of Little Falls.

REPORT OF THE SECRETARY.

Rooms of the Farmers' Club,
Little Falls, *January* 16, 1863.

To meet the provisions of the statute with respect to town associations, I beg leave to submit the following as the sixth annual report of the Farmers' Club of Little Falls:

Before touching upon the usual topics of the year, it may be well to allude briefly to the early history of this society. Ours was the first club association of the kind organized in Herkimer county. Its primary object was to bring our farmers together for the purpose of comparing notes on the management of farms, and the sifting out of improvements made by the individual in this or that branch of his calling, for the general good or benefit of all. At that time no ready means were at hand to obtain and apply knowledge of this character. Each farmer had his own peculiar notions and method of managing his farm or dairy, and generally believed his own to be the better system.

In the manufacture of cheese, it is true, improvements were from time to time being adopted, and the best system sought for, because the market imperatively demanded it. Cheese buyers, too, were threading the county, comparing one dairy with another, and making suggestions for the correction of imperfect cheese, and at the cheese depots farmers talked the matter over more or less with each other; but apart from this, little or no attention was given to improved methods in other branches of their business. Our county fairs failed to elicit a general interest from citizens in all parts of the county; local jealousies were springing up as to the manner in which its fairs were located and managed. It was claimed that it represented only a part of the county, that many towns were ignored, and that a few individuals who were prominent in its management were running the concern for the benefit of their own immediate neighborhood. Doubtless much, and perhaps the greater part of all this, was the result of inactivity or want of interest on the part of those complaining; but whether the cause of complaint was well founded or not, it prevented the society from exerting its proper influence throughout the county. At this juncture the towns of Fairfield, Manheim, Little Falls and Danube associated together and formed the Farmers' Club of Little Falls. No restriction, however, was had as to persons joining from other towns, whenever they saw fit to avail themselves of the benefits of our association. To awaken interest, to call the attention of farmers of the county to their profession, and the best method of conducting their business, the club took perhaps one of the best means that could be devised, viz: the reading of original essays on particular branches of farming, and a semi-monthly discussion of these topics among its members. These essays and discussions were regularly reported for and published in two of the county papers, and thus sent broadcast among the people. Such a course perseveringly pursued, must, sooner or later, bear fruit—just as surely as the general spread of other intelligence results necessarily in developing the mind and character of a people. Sometime after our organization, and following our lead, the Win-

field association was formed, and for a time also gave publicity to its discussions. These associations have worked changes it is believed in public feeling, and, while the best interests of members have been promoted, the county society has been strengthened.

A decided advance, it is believed too, has been made in almost every branch of agriculture practiced in the county during the last six years, and it is not too much to claim that the Farmers' Club of Little Falls is justly entitled to credit for its influence in bringing about these results. The experience of these years only serves to confirm the opinion that associations formed on a basis where mutual benefits are conferred, fostering neither jealousies nor partisanship, where frequent discussions are held among its members, opinions freely interchanged, and advice given and received, are of great value to the communities where they exist, and exert a beneficent influence which in time is felt throughout the whole land.

It is at these gatherings that the young should congregate, either to take part in discussions or otherwise, and thus early learn habits of thought and expression, acquiring a fund of knowledge drawn from the life-long experience of older members, which cannot fail of its reward in after life.

An instance in point might be cited in that of a *now* noted agriculturist, who, while engaged in other pursuits than farming, was accustomed to attend meetings of a farmers' club, with no view of practical utility, but who, failing in business, found his account in it from the knowledge garnered up, and was led to turn his attention to farming, soon amassing a fortune and becoming the means of shedding a broad light over the land for the advancement of improved culture. During the year last past the semi-monthly meetings of the club have been kept up, and the general plan of essays and discussions adhered to.

Meteorological Changes, Soil, etc., etc.

The season of 1862 was noticeable in this, that from early spring to late fall very little rain comparatively had fallen at any one time, or through the season. At the opening of spring a large body of snow covered the ground, and this melting away gradually, passed off without much rain, so that at this season the usual quantity of water was absent from the soil; comparatively dry weather followed, and, except occasional showers of short duration, continued through the whole season. The summer was not marked with extremes of heat or cold.

Drought for any considerable length of time in a dairy region is justly regarded with alarm, since the countless herds must have food and water, and when there is a scarcity of water the poor animals endure great suffering, and are the cause of intense anxiety on the part of the farmer, who is unable to supply their wants. Fortunately the grazing lands of Herkimer are supplied with numerous streams, and the character of her soil is such as to withstand dry weather for a much longer period than in less favored localities. Through some of the northern counties this drought was severely felt, and crops in consequence cut off. The peculiarity of soil in Herkimer to withstand drought is believed to be due to its admixture with Utica slate, the principal underlying rock of the county. This rock, on being exposed to the atmosphere, falls readily in pieces, mingling with the

soil in a finely divided state, and is retentive of moisture. The rock itself is of that flaky nature, and so filled with innumerable seams, as to act somewhat on the principle of under-drains. Hence, all over this slate region we have heard of no great failure of crops from drought, though in some localities springs and streams were exceedingly low, producing a scarcity of running water.

Fruit.

The fruit crop of 1862 was abundant in this vicinity. Of apples, in particular, the yield was not only large, but the fruit more perfect than in years past. This was more than many had anticipated in the spring, in consequence of the great injury to trees during the previous winter from ice. There were two of these storms of rain in the winter, where ice formed on trees in such masses as to cause serious damage. The last storm, in particular, proved very destructive—the ice remaining long on the trees, and in that condition being subjected to high winds. This last storm referred to occurred during the latter part of winter, and covered a broad extent of country. On the low lands and in sheltered localities trees escaped for the most part from serious damage; but on the uplands the ice was formed in such large masses on the branches when swept by the winds as to prostrate whole orchards. For several days loud reports along the forests could be heard from the crashing timber. In many pieces of forest the grounds were strewed with branches and broken trees. In some orchards trees were completely stripped of their tops; in others, large branches cleaved off left the trunks an unsightly object, and in a condition soon to decay or become worthless for fruit. This storm will long be remembered here as the most destructive to fruit and forest trees of any that had previously occurred in the county.

The apple orchards in this locality are, for the most part, composed of old trees with grafted tops, and it is only recently that an effort has been made to plant young orchards. The soil and climate of Herkimer are favorable for the production and perfection of almost all kinds of fruit grown in this latitude, with the exception of peaches and apricots; our winters proving too bleak and cold for the profitable growing of these varieties.

Grass.

The grass of Herkimer is vast and excellent. At no time within the past twenty years has there been what may be called a failure of the great staple of the county. In some seasons the yield has been less than in others, but never within the time specified have our farmers been necessitated to import hay for wintering stock, or compelled to dispose of their herds or winter them in other localities. So sure and uniform has been the yield of this crop year after year that our dairymen have come to look upon its failure as among the extreme improbabilities. I think it was in the year 1841 that a failure in grass occurred in this county by reason of drought. The season is represented as having passed with scarcely a drop of rain from spring to fall, and the parched earth yielded so scantily that many were obliged to turn off a considerable portion of their herds. Cattle were in such lean condition by the latter part of summer and fall, and the neces-

sities for selling so imperative, that animals were disposed of for less than half their value.

The hay crop of 1862 is believed to be ample for wintering the stock of the county. Within the limits of the club it was considered a full crop, and as the grass matured slowly and was harvested in good order, its superior quality enables it to go further and produce better results than could be had from a larger bulk of rapidly maturing grass.

Pasturage through the season was perhaps not so abundant as in years previous, but no general scarcity has prevailed to reduce the herds in flesh. On many farms the yield of milk has been doubtless less than the season previous. This must have been necessarily so, as the animal yielding much milk requires a proportionate quantity of food, which must be readily obtained with little labor. One cause, too, for the diminution of milk in many dairies resulted from the failure of water in certain springs and streams, subjecting the stock to longer journeys in order to slake their thirst.

I have not at hand statistics sufficient to make a correct estimate of the quantity of cheese manufactured in the county the past season, but it is believed the aggregate quantity will not fall much below the average of former years. Early in the year the club, by resolution, appointed several of its members to overlook, during the season, and take notes on the growth and condition of certain crops raised in the county, and more especially within the limits of the club. In accordance with the resolution referred to, these reports are subsequently given, with the names of the several writers, who furnished them, under the headings of their several reports.

Cheese—Market Prospects, etc.

Within the last few years the system of marketing cheese has undergone important changes. Formerly cheese was sold by the dairy, either for a part or the whole of the season, the time of payment being made as agreed upon between the parties, but it was on time, generally at the close of the year. Afterwards the sending of cheese to commission houses, to be sold on commission, was in favor, and to some extent is still practiced. But the system now generally adopted through the county is to sell for cash on delivery at the depots where it is to be shipped. At these points buyer and seller meet, on stated days twice a week, and the cheese is sold in smaller or larger quantities, as it suits the purchaser or is fit for the market. Since 1859 the exportation of our cheese to Europe has been largely on the increase. This is gratifying, because it gives us the assurance that a foreign demand, while it promises encouraging prospects for the future, must necessarily render prices stable.

The value of good Cheddar cheese in England, is, to the manufacturer, in the neighborhood of fourteen cents per pound, and when it is taken into account that a living profit can be realized by us in selling cheese at seven cents per pound, a broad margin, it will be seen, is left for increased profits on our part by exportation. Herkimer county cheese has the reputation, and is pre-eminently the best manufactured this side of the Atlantic; and if we shall make it equal to the Cheddar, of England, we see no reason why the demand should not be steady, and the average value of our cheese, for

years to come, rule high rather than the opposite. That the exportation of American cheese is causing some anxiety among dairymen across the Atlantic, will be seen from the following extracts from the "after dinner" speeches made at the recent great show of dairy produce of the Ayrshire Agricultural Association. Mr. Bowles, of London, said:

"He wished to impress on the cheese makers of Ayrshire and Scotland that they should endeavor to beat his own countrymen, the Cheddar dairymen. He could assure them that in London there was no demand for inferior goods. They had a better demand for American dairy produce than for indifferent lots of home manufacture.

"It was quite useless for the farmers of Scotland to compete with the farmers of America, except in one way, and that was by making a better article. In London there was always a steady, active demand for fine goods, which could always command a large price. To show that he was right as to the inexpediency of Scottish farmers competing with their agricultural brethren across the Atlantic, unless they provide a first rate article, he might tell them that for the year from the 1st January, 1861, ending December 31st, there were imported 716,673 boxes of American cheese, equal to 45,000 tons. This year the importations were on the increase. For nine months, closing 30th September, 1861, the imports were 449,678 boxes, equal to 28,000 tons, while for the same period of 1862 the numbers were equal to 31,000 tons, showing an increase of 3,000 tons over the corresponding period of last year. These figures plainly proved that competition was futile, unless the Scottish cheese makers could turn out a superior article. He would also take leave to say that in London they had a greater demand for colored than for pale cheese, etc., etc."

Viscount Ingestre said: "A remark that had fallen from one of the judges, had impressed him with the belief that a fearful responsibility was laid upon the counties of Ayr and Renfrew. In fact, he was afraid that they were guilty in part in carrying on the American war. He knew now where some of the finances came from (after hearing of our large importations of cheese from across the Atlantic) that enabled the Americans to cut each other's throats, and he thought it a sad infliction. He had yet to learn that we could not produce plenty of cheese for our own consumption, without being indebted so largely to our own child across the water."

Mr. Harding, the noted cheeseman, through whose enterprise the Cheddar system had been introduced into Ayrshire, said: "They had heard the result of making bad cheese, and it was not like Englishmen or Scotchmen, and especially not like Scotchmen, that they should be outdone by their brethren across the Atlantic. The Americans would beat them out of the market if they did not exert themselves and make better cheese. Let Americans make cheese for the lower classes, but let it be the aim of the home farmers to make cheese for the higher classes, which always brought a better price."

For nine months of the year last past, up to the 1st of October, we find that 62,000,000 pounds of American cheese were exported to Britain, which, at ten cents, comes to $6,200,000.

May not the Herkimer county dairyman feel a just pride that his efforts

to improve the quality of cheese, seconded by other citizens of our county, the great cheese dealers, have been instrumental in bringing about this result? and is it not just for us to give due credit to a Herkimer county man, Samuel Perry, of New York, who, in 1860, conceived the idea of shipping our staple on a large scale, and through whose efforts the British public was brought to a better appreciation of American cheese?

During the latter part of the year just past, our dairies sold readily for from ten cents to eleven cents per pound, and we can see no reason why these prices should not rule for the coming year.

Annual Fair.

The annual fair of the club took place October 7th, 8th and 9th, on the fair grounds of the club, and was well attended.

When it is taken into account what the county had done in the way of furnishing volunteers for the war; the exertions made by our citizens to fill the quotas under the President's call for 600,000; the large bounties offered by towns and county—the former amounting to $300 in the towns embraced by the club—a larger attendance, and a better exhibition of articles were had at our fair than could have been expected. The show, in some respects, may not have equaled some of those previously held by the club, but it was creditable in every department. The value of premiums (including books) offered, amounted to $680. Of the cash premiums paid, twenty per cent. was retained by the club as an offset for the entries of articles; there being no charge made for entries of any kind except on horses competing in trials of speed, for which ten per cent. on premiums offered was charged.

On the last day of the fair, October 9th, the annual address was delivered by the Hon. George W. Smith, of Utica. This address was deemed of such merit that the club, by resolution, ordered it to be printed.

Books, Seeds, etc.

During the past year the club has been in receipt of books from the Commissioner of Patents, at Washington, and also from the Secretary of State, at Albany, the usual number of copies of Transactions of the State Society, and of the American Institute. One hundred volumes of the *Dairy Farmer* have also been purchased by the club. A portion of these books have been distributed as premiums. The club acknowledge the receipt during the year of several packages of seeds from the Patent Office, Washington. These, with seeds presented by members, have been distributed. A few packages of wheat are on hand to be used the coming year.

At the time of making my last annual report, the club had ordered an assessment on its members in order to pay off indebtedness incurred in the erection of a building for holding our annual fairs. The amount due the club from this source has only been partially paid. The property held by the club, at this date, consists in a substantial frame building, thirty-nine feet wide by eighty-four feet long, and the accompanying fixtures, for holding annual fairs; the club library, now numbering some 100 or more volumes, and the unexpired lease of some thirty acres of fair grounds, on which is a circular track for driving horses.

All of which is respectfully submitted.

X. A. WILLARD, *Secretary.*

REPORTS OF COMMITTEES.

The Wheat Crop of 1862.

BY S. S. LANSING, OF MANHEIM.

The wheat crop of Herkimer county is so limited in the extent of its cultivation that it can hardly be classed as a product of the county for the last twenty-five years.

The dairy interests having attracted the attention of our farmers, the county gradually abandoned the cultivation of grain, (except coarse grains for stock feeding,) and in many localities little or no grain is raised, the dairymen preferring to buy their grain for feeding cows, horses and hogs, to plowing any part of their lands, that by top-dressing with manure, lime or plaster, can be made to produce grass. Cheese, as a staple, took the place of the wheat crop, and about that time the wheat weevil made its appearance, destroying the crop many years in succession, disheartening the most persistent of our wheat growers in their determination of raising their own bread. In the town of Manheim I know of but one man that has kept on sowing and raising half, quarter and no crops, until he again gets a good compensation for his labor. This same neighbor told me he had never bought but one quarter sack of flour in his life, and was ashamed of that.

Within the past year, in this vicinity, several good and remunerative crops have been raised, in fact some of our oldest farmers and wheat raisers say they never saw finer crops of wheat than raised in our town this season; one in particular, that attracted my attention, was a field of five or six acres, Mr. P. P. Snell's, a member of the club. The soil was a slate, highly manured (the amount per acre of barn yard manure I did not learn), sown on barley stubble, and, judging from its appearance, not in very good condition at the time of sowing, it being dry and lumpy; sown about the middle of September, seed he called the red chaff, bald white wheat, introduced many years ago from the northern portion of the State or Canada. Result, from 13½ bushels sown, yield 214½ bushels of plump wheat, that would compare with any of the fancy samples of western grown. My own experiment was with the same wheat, and although nothing like the yield, raised my year's bread with little or no expense. I had a small piece of land, a corner of my meadow that the timothy had run out in, and nothing but white clover, matted to the annoyance of the mower with machine; mowed this early, and during harvest; rainy days, had my team plowing when we could not make hay; plowed about nine inches deep, then at intervals of a week or ten days cultivated it thoroughly with a two horse cultivator; this treatment repeated three different times, each time cross cultivating, leaving it as mellow as a summer fallow (which is and should be out of date); the soil a gravelly loam, without manure; I had, from 5½ bushels sowing, 60 bushels. Two other fields in my neighborhood, treated same as mine in every respect, except that, after the first cultivating, twenty to thirty loads barn yard manure were applied per acre, spread and well mixed with the surface soil in the subsequent harrowings, yielded in both cases twenty-five per cent. more wheat, richly compensating for the extra trouble and expense of the manure. I think our dairymen could find

every year small pieces of an acre or two in their meadows that this practice would improve; and with a hundred panels or so of portable fence, could fence off for a year any part of their grass lands, and by seeding it with wheat in fall return it to grass the next season. By the way, I forgot to mention that I seeded the field. I experimented upon it with timothy in the fall, and the young grass, at the time of cutting my wheat, in the entire field was forming head, some fully out, and affording, when well cured, fodder for cattle, that they prefer to clover hay.

The inference to be drawn from the many successful experiments in this vicinity, and throughout the county, as far as I have been able to ascertain, that wheat can be as successfully raised as ever, and I urge that the soil of our county has been growing richer in its wheat-producing elements from its long rest of a quarter of a century and over (unlike rest given the worn-out plantations of the South); the increase of cattle kept upon our farms, the ratio increasing yearly, until double the number of cows, in many instances, are kept throughout the year, that were kept at the onset of dairying or in a term of fifteen or twenty years, proving that the fertility of the soil of this county is each year increasing in richness, and that the virgin soils of the West, or of our own county, were not more rich in the chemical ingredients and elements of food for the wheat plant, than is the "rested," renewed, enriched old wheat fields of our dairy county. There are yet in our midst, among the older farmers, who while away many a pleasant hour of a winter's evening in discussing upon the many pleasant reminiscences of the good old times when, after thrashing was done, the balance of the winter was devoted to drawing off wheat to Albany—this county, Montgomery and Old Schoharie being then the great wheat fields of the west.

January 12, 1863.

Report on Corn Crop of 1862.

BY A. REED, OF DANUBE.

The season of 1862 was not propitious for the production of corn. The dryness of the weather in the spring retarded, and in many instances prevented the suitable preparation of the ground. Heavy or tenacious soils were difficult to plow, and when plowed were often lumpy and could not be reduced to a proper degree of tilth without much extra, and generally not available, labor. Corn planted upon such pieces was slow of germination; some failed entirely, and thus at the outset a bad start was had. The summer months were also dry, and as a consequence the growth of corn, upon soils of the character mentioned above, and upon soil plowed late in spring, was small—in many cases surprisingly so. Some pieces under my observation presented the singular anomaly of a starved crop upon a fertile soil. They were upon sod plowed just before planting. The sod turned under in a dry state, remained dry throughout the season, and did not rot, consequently it gave no nutriment to the growing crops, and in a measure prevented the roots from uniformly penetrating the subsoil—their principal recourse for moisture in a dry time. An application of about thirty loads of stable manure per acre on a portion of such a piece, and eight loads of

hog manure per acre applied in the hill upon another portion of the same piece, was productive of surprising results. The portions so manured grew from the start more vigorous, and were of better color than adjoining portions that received no manure. As the crop progressed the difference became more apparent, so much so that persons passing by in the highway noticed it. At harvest time, upon the manured portion, the ears were large and uniformly sound, the growth of stalks heavy, and the yield of grain about fifty to sixty bushels per acre; while upon the unmanured portion the ears were mere nubbins, small and mostly unsound, the growth of stalks very inferior, and the yield of grain—good, bad and indifferent, all told—about twenty-five to thirty bushels per acre. The soil upon the several portions was similar and fertile, and the culture the same throughout.

Another piece of meadow sod, that had not been plowed for thirty years previous, and of high repute for quality, was plowed late in spring, and planted to corn without any application of manure, with a result similar to that of the unmanured portion of the piece before spoken of.

The frost, about the 1st of September, injured many pieces of corn. Upon the high hills north of the river whole fields were killed outright, and nearly a total loss. Upon the southern side of the valley of the river, low pieces were injured more or less. The autumn was favorable for ripening, and those pieces situate on moist or mellow soil that escaped the frost of the first of September, yielded a very good crop of very sound grain, while other pieces yielded poorly in proportion as they were under the influence of the disadvantages mentioned. The crop as a whole is a little below the ordinary average.

The cultivation of this cereal deserves more attention than it has hitherto received. No grain is more remunerative to the producer; none more nutritious; and none adapted to the economic support of such a variety of farm stock. It is the essential grain for the dairyman. Just the thing for finishing the fattening of his porkers; for putting the cows and other stock that he wishes to turn off in a marketable condition; for keeping up the strength and condition of his milch cows in spring, and for furnishing them with a full supply of the comforts of milk. There is much difference in opinion as to the value of corn meal for the production of milk; but when it is considered that the primary object sought in feeding milch cows in spring, is as much the keeping up their strength and condition until they go to grass, as the increase of their flow of milk, then there can be little doubt but that corn meal is suitable and economical for the purpose. The large quantity of phosphate of lime and oil in its composition, show that it must be excellent for cows at a season when there is such a drain upon them of those constituents.

The corn stalks afford a quantity of fodder nearly equal to the same amount of land in meadow, and thus, while the maize field contributes largely to the maintenance of the dairyman's herds, on the other hand, by means of the large quantity of manure at his disposal, and by the richness of the old grazing and meadow lands, that he may alternately break up for this crop, he is enabled to produce abundant and profitable crops of this great American cereal.

Report on the Potato and Barley Crops.

BY S. S. WHITMAN, OF LITTLE FALLS.

From such dates as I have at hand, it appears that the potato was grown successfully for about one hundred and twenty-five years after its introduction into the territory of the United States, including a period from 1718, or 1719, to 1843. Previous to the latter date, frost was about the only enemy the potato had to contend with. It growed on all our productive soils, either with manure or without. With good cultivation it gave a large yield, and if neglected, it would even then not refuse to give a fair crop. It was the little loaf always ready for baking—a friend in poverty or luxury.

With all the discouragement, for near twenty years, no one is willing to give up *trying* to get good potatoes—we have nothing to supply their place on the table.

Had it not been for the disease that made its appearance in 1843, that has thus far baffled both scientific and practical men in Europe and America, we cannot venture to guess at the amount that would now be produced, for the increased product from 1810 to 1843 was enormous; large quantities were used in the manufacture of starch in some sections, and thousands upon thousands of bushels were raised to feed stock. But in 1843, a plague like Egypt's came over the country. The farmer, with surprise, saw the vines blacken, as if visited by an untimely frost. Whole fields stank with decay. Rotten potatoes was the rule, sound ones the exception. Since the appearance of disease, all old varieties have disappeared, and other kinds have been sought, that were hardy and of good quality for table use.

For the past ten years, probably no sort has been raised in this county with as much success as the kind known in different localities by different names. In this town it is called the Northern Red, Western Red, Black River Red, and Hemlock. In the northern part of the county they are called the Smalley, in the neighborhood of Baldwinsville, the Canada Red. Potatoes were sent to me from Wayne county, highly recommended for being free from rot, called Dadd's Best, but a careful comparison convinced me they were the same as the above named. I have been told that they were brought into some one of the Black river towns from Coventry, and were there known as the Coventry potato. In the spring of 1845, a lot was shipped to Mohawk, and there sold. Among the purchasers was Rodney Bucklin, and from the seed of his purchase I obtained near a half bushel. From this seed I have continued my stock.

No potato introduced since the rot commenced has proved as valuable as this. At present it forms three-fourths of all that are brought into this market, except for early variety.

Its shape is oval, slightly flattened, very smooth, full eyes, with a full eyebrow, which is a characteristic of this variety. It is never hollow or watery about the center. The skin is about the color of the inner side of hemlock bark; from this circumstance it is called the Hemlock potato. Its flush is of a yellowish cast, with a slight streak of a darker hue around the center. It is of the late varieties, but when ripe, it cooks well till late the following season. No variety has rotted less than this.

Many varieties have been introduced within a few years, and some promise well as to yield, qualities for the table, and hardiness. Among these are the Jersey Peach Blows, Prince Albert, White Mercer and Garnet Chili. The above are all late varieties. Query. Was not the Jersey Peach Blow introduced from Nova Scotia several years ago, when large quantities were shipped to New York? I had a variety, that was called the Nova Scotia, that resembled the Jersey Peach Blow in every particular. The Carter, a seedling by Mr. Carter, of Washington county, was for many years a favorite; but it has rotted so much of late, that but few are raised. So with the White Mexican—the best baking potato. The California produces a large crop of late potatoes, but is not esteemed for the table, except late in the season.

In 1832, Dr. John Homes, of Danube, introduced a seedling of his raising, that he called the Early June. For being early, productive, a good table potato, and hardy, it stands No. 1, and is extensively raised in the neighborhood of its nativity.

Goodrich's seedlings (among which is the Garnet Chili), Pinkeye, Rustycoat, New Hartford and Coppermine, are well recommended, and so are many others that have not been raised sufficiently in this locality to fully test them. The country is under great obligations to men who have obtained good varieties from seedlings. The season of 1862 has been the best for potatoes that we have had since the rot commenced. Good crops have been raised and are keeping well. We have not had more than two or three years since the disease first made its appearance, that would compare favorably with the past, and it is the only one in which potatoes have in the fall sold for less than twenty-five cents per bushel. Although many remedies have been recommended for the disease, and many theories presented as to its cause, we are still in the dark, and have to depend more on the blessing of a favorable season than any prescription by our most observing men.

Experience has taught us that it is safer to plant early, to avoid strong manure, and wet heavy land. If manure is used at all, use it for a top dressing, instead of putting it in the hill; avoid too much seed, cultivate well, dig when you think best, store with care, and sell when a good price is offered.

Since writing the above, I see by notes in the *Country Gentleman*, of C. E. Goodrich, of Utica, that the most healthy and productive year previous to 1862, was 1852, next to that, 1854 and 1856; 1851, 1855 and 1861, were years of severe disease.

Query. Would it not be well to call the first described potatoes the Eyebrow, from the peculiar eyebrows in this variety?

Barley.

In complying with the request of the club, to take some notes of the barley crop, I can only say that there is now scarcely a field of barley raised within the bounds of the club. The large fields of barley that in former years were spread out over these hills, have given place to pastures and meadows, to feed cows, to supply milk, to furnish cheese for the great demand on both sides of the Atlantic.

Of all of our old crops, none have been so completely turned out of doors as barley, except flax. Yes, flax! How it calls to mind the days of pulling flax in the summer, and whipping off the seed, the spreading and turning. The flax days in the spring, the break, the swingling knife and board, the hatchel and the distaff. Then we had hay days in the summer and flax days in the spring, saying nothing of dog days. We now have only hay days and cheese days. Flax days are nowhere. There are a few bushels of the ball barley raised, but used mostly with carrots for coffee.

Report on Vegetables.

BY JAMES VAN VALKENBURGH, OF MANHIEN.

Having been chosen by the Farmers' Club, of Little Falls, to report in relation to the general growth and condition of same of the most prominent of garden crops for the past season, the following will be found to be the result of my observations, confined wholly to cabbage, tomatoes, beets and onions:

The cabbage crop, with but few exceptions, has been as good as usual, particularly where a proper system of rotation has been practiced. This will be found highly important in the production of this vegetable. I have made but one discovery in this crop during the past season, which is to me new and worthy of note. This was on a piece of ground which had not been used for cabbage for five years. I manured it well with old, well rotted, barn yard manure, and transplanted it with hot-bed plants of the early Winningstead cabbage, about the last of April. They grew finely until after the first hoeing, when I very unexpectedly found the whole patch of one thousand plants drooping, and several of them turning yellow, and upon close examination found them attacked at the roots by a small white worm, about the size and appearance of a common cheese skipper. Some roots were visited by a half dozen or more of these vile intruders. Not knowing how to deal with these unwelcome visitors, I resolved to commence harshly with them, either to destroy them or the crop, which I was satisfied they would do if left unmolested. I took one part of lime, one of salt, two of ashes, mixed them well, and applied a small handful about the roots of each plant; this was fortunately followed by a fine shower of rain, which ended the destruction at once, and about eight hundred out of the thousand revived, and grew to be fine heads, ready for market by the last of July.

Tomatoes have yielded remarkably well for the past season, and I think matured with less imperfections than for several seasons past; almost entirely free from decay, even where the vines were allowed to lie upon the earth without the support of frames, etc. Experience enables me to say with confidence, that the tomato crop will continue to improve for several years in succession, in the same soil, even without manure. I have raised five crops in succession on a piece of stony, gravelly soil, without any manure, and think the last crop better than the first. The crop for the past season was somewhat later than seasons previous, in consequence of the drought during spring, which delayed the transplanting from the hot-bed until very late—I think about the first of June, which is some two or three weeks later than usual, the result of which was a tall and slender

growth, for which time alone could make amends, consequently ripening did not commence until about the last of August, but continued until nearly the last of October, with an abundance of fruit in great perfection.

For the beet crop the season has been very favorable. An extensive growth has been obtained, together with an excellent quality. Nothing special has attracted my attention with regard to the beet crop, during the whole season, except that a perfect success seemed to await the harvest. A large number of beautiful specimens of the different varieties were exhibited at our fair of the Farmers' Club, which were in appearance perfect in every respect. No experiments have been made to my knowledge, in this locality, to manufacture sugar from the beet. It is supposed to contain less sugar in this section of country than in some other soils and climates.

The onion, as well as many other kinds of vegetables, has, for a few seasons past, been arrested in the early stages of its growth, by an insect bearing in every respect an appearance like that discovered among the cabbage roots, and has with me nearly destroyed the onion crop for the last two or three seasons. It commences its work about the time of the first weeding, when the tops are from two to three inches high, thinning them out rapidly. They may be found by pulling up those which begin to wilt, and upon examining the roots you will find some of them with their heads inserted in the bulb, and others lying among the small fibrous roots. Those which are slightly attacked will continue to grow during the season, and then rot in the fall. I have not as yet used any application by which to prevent their ravages, but believe them to be the same insect as found among the cabbage, and if such be the case, the same application, of course, will be found beneficial.

Report on Grape Culture.

BY CHARLES OYSTON, LITTLE FALLS.

The growth and culture of grapes for the last year, in this vicinity, has been quite gratifying. Though the summer was dry it did not act injuriously on grapes. It perhaps caused a less growth of wood, but it was better ripened, being quite firm at the fall pruning time. As to the fruit, it has seldom ripened so well; even the Catawba attained a degree of ripeness which rendered it quite palatable. In reviewing the progress of grape culture for the last seven years, the result is quite satisfactory. Seven years ago there was scarcely a pound of grapes to be found on sale in this place; now the market is well supplied in quantity if not in quality, and ere long the quality bids fair to rival the quantity.

The following kinds are now in successful cultivation in this section: Delaware, Diana, Rebecca, Sweetwater, Muscadine, Concord, Hartford, Prolific and Isabella. The first named is unquestionably the grape for excellence; it is hardy, thrifty, short-jointed, bears abundantly, and the fruit is first rate, and what is of the first importance, it ripens early. As to the other kinds I have mentioned, their order of merit is about the same as I have placed them, though of course different people will have different opinions, depending on taste and habit. One thing I have observed, that while the Isabella, Concord and some others, do first rate when trained up

against a wall, and facing the south, the Sweetwater does much the best when planted out of the influence of a wall. The Muscadine is the earliest ripe, and though its flavor is not equal to some others, it is nevertheless a great favorite on account of the certainty of its ripening. With respect to the Diana, I would advise those who may undertake its culture to take at least one-half of the bunches off as soon as they get set, as it is a tremendous bearer, commencing two years from the cutting, and continuing to show a great deal more fruit than it can ripen. We practice laying down our vines in winter, to avoid the destructive effects of frost, though the Concord and Muscadine will stand a moderate winter without injury, and judging from the hard and compact nature of the wood of the Delaware, it will be likely to stand the winter full better than the others. If, in addition to its other good qualities, it should be found to possess this, it will render it still more valuable, for there are many situations in villages and cities where grapes may be grown, but where it is inconvenient to lay them down.

Report on Plums and the Culture of the Tree.

BY HON. A. WILCOX, LITTLE FALLS.

If it were not for the value attached to this delicate fruit, its cultivation would long since have been neglected. Indeed, in some sections of the country, its culture has been nearly abandoned, owing to the difficulties, first in rearing a healthy tree, and finally in securing the fruit against the well known pest—the curculio.

To secure a vigorous growth, the tree needs the same high cultivation that the dwarf pear requires. It will not do to punch a hole in the ground, crowd the young tree therein and stamp down the roots.

Besides being carefully planted out, with mellow earth around their roots, and a like territory large enough for the creeping fibers to reach out and feed upon the adjacent soil, they need also fertilizing agents upon the surface; and a quantity of lime dust scattered among the roots in planting out the trees would be a good paying investment.

When it is remembered that the tree below ground will extend itself as far as it will above ground, how essential that the ground be frequently stirred upon the surface during the growing season, to let in the air and absorb the heat and moisture and allow egress for the escaping gases! Nor is it sufficient to stir the surface soil. It should be worked spade deep, by the spade or fork, two or three times in a season while the trees are young, and mulched in dry weather, care being always taken not to injure the roots. It may be observed, however, that cutting off the roots a distance from the tree, or "root pruning," if it be done with a sharp knife, so as to induce a free growth of fibers, will work no injury to the tree, provided it be thrifty. The tendency will be to bring it into bearing. Pears grafted on the quince come into bearing sooner than on the pear stocks, on account of their fibrous roots. The same may be said of the common apple on paradise or dwarf stock. And here we have an answer to the query so often indulged in, why a certain tree, so thrifty, so very vigorous, does not bear. The fact is found that it is not making rootlets. A tree which fruits very heavily will make but little wood, and a tree

making a superabundance of wood will not make much fruit. It will take longer before it will commence bearing, but when it does bear it will do so more abundantly. Trees that overbear may only bear every alternate year. Hence it may be advisable to thin out the blossoms or to remove a portion of the fruit as soon as formed upon all trees that overbear. Trees thus treated will not be likely to shed their fruit. I would advise removing the fruit from the extremities in all cases, otherwise the tree will never attain its full growth, and to distribute the fruit in thinning, leaving the bulk of the crop on the main branches. This and other general remarks will apply to other kinds of fruit as well as the plum. We may often notice trees set full of blossom, and if the fruit is not all shed in consequence it will be inferior in size and quality, while a moderate setting will insure the fruit, and in superior quality and size. It is sometimes proper to head down the tops of very strong growing trees in hot weather, the season previous to their fruiting, as this will tend to check the growth of the tree and form the fruit buds for the next year's crop. An unusually hot season, or any other agent that will check the growth of the tree, such as tying down the limbs, &c., will bring on the fruit. I make these random remarks for the reason that I consider a proper attention to the laws of growth, health and disease is all that is wanting to grow our fruit crops successfully and profitably, and without which, and a partial observance only of a few blind rules, we shall fail and our labor be lost. As a specific treatment seems to be required to meet the special wants of the various varieties of fruit trees, it will require much experience and chemical skill to determine the full wants of each; and I will confine myself chiefly in this disquisition to the consideration of the difficulties in growing this fruit, and also the remedies. We have seen that it is of primary importance to start the tree well, and we are left to treat it according to circumstances. The tree, to say the least, must be healthy.

In the same latitude on the Pacific coast this fruit may be produced almost without care, the trees growing in the compactness of a hedge; but even there a tree properly trimmed and cared for will manifest its thrift in an astonishing growth of wood, and a yield much larger and of more perfect fruit. Here in our variable climate these proper attentions cannot be dispensed with, and it will tax the perseverance only of the fruit grower to raise this fruit successfully. I may say that the tree needs but moderate trimming while young, and but little after it commences bearing, excepting to lop off diseased branches and the black warts which form upon them. While I would recommend taking off these excrescences immediately after the fruit season, it is advisable to remove branches otherwise diseased, during the growing season at any time, making a clean cut with a sharp blade. After removing the warts, the wounds should be soaked with soft soap suds or copperas water, and an adhesive plaster of grafting wax of the proper consistency should be applied to the part to promote the health of the tree, as all scars and wounds exposed in our severe climate might otherwise lead to permanent injury. But all our care and labor in growing the tree will be to no purpose if we allow the curculio, the great enemy of the plum in this region, to step in and destroy the growing fruit. I have tried various remedies to rid the orchard of this pest, nearly all of which

have been beneficial. I find lime one of the best remedies, which is applied by sprinkling or sifting upon the trees once or twice a week during three or four weeks from the time the fruit is exposed. It should be done in the morning or when the moisture is on the leaves, so that the lime will adhere to the foliage. I have found shaking the trees early in the morning quite as successful. It should be done two or three times a week, commencing immediately after the blossoms fall, *i. e.*, as soon as the fruit is formed, and continuing six or eight weeks, till it gets too far advanced to be injured by the sting or bite. Perhaps it would be well to thump the tree with a club or pole, wound with cloths or something else suitable, so as not to mar the bark. This sudden jarring would relieve the insects of their hold on the tree, and they would drop, and may be caught by this simple contrivance. My method has been to use a white cloth as large as necessary, attached to a stake at each corner, with a slit from the center to one side of the cloth, and to stake the same so as to encompass the tree below the limbs.

I will mention still another treatment I have practiced with success. It is to syringe the tree with a liquid formed from one pound, or about that quantity, of sulphur, four quarts of slacked lime, and twelve or fifteen gallons of water. The liquid appears to be an antidote for the sting of the curculio, if applied to the wound soon after it is made. It is remarkable that the bite of this insect is more fatal in hot, dry seasons, than in cold and moist ones. But in cold and wet seasons the branches are often not sufficiently matured for our rigorous winters, and become frost-bitten and die. During the summer of 1860 our plum trees in this vicinity made a luxurious growth, and bore fine specimens of fruit, but the wood was too spongy and tender to endure the cold, and the consequence was that many of them died out the following winter. I may mention that certain varieties are liable to mature their wood later than others, and therefore are more likely to be frost-bitten and injured, if not destroyed. Coe's Golden Drop belongs to this class, but it is too great a favorite to be disturbed on this account. I would here suggest spading around this class of fruit trees early in the spring, early as consistent in view of the spring frosts, to warm the soil about the roots, and perhaps to work about them more frequently during the early part of the season would advance them to early maturity in their year's growth, and pinching the extremities of the branches with the thumb and forefinger would naturally check their growth and harden their wood. The Washington, Jefferson, Imperial Gage, Bleeker's, Magnum Bonum or Egg Plum, Schenectady, Catharine, and two or three varieties of yellow or sugar plums, may be added as the best varieties of this region. The Bleeker's Gage is a good grower, great bearer, and one of the best kinds for pickling, but not equal to the common blue for preserves, being wanting in the tart which suits the common palate better; but they are both subject to black warts. I may here say that the varieties bearing light colored fruit are not so subject to the warts as those bearing dark colored fruit.

Plums falling from the tree, caused by the bite or sting of the curculio, should in all cases be destroyed. The tree should be washed once or twice in a season with soap suds, not only to keep the body healthy but to break

up the hiding and hatching places of these troublesome and destructive insects; and every precaution should be taken to prevent their increase and ravages, and an abundant harvest will reward us for our labor.

Annual Meeting of the Farmers' Club.

There was a good attendance of members at the annual meeting of the Farmers' Club, January 16, 1863.

Officers elected for 1863: President, S. S. Lansing, Manheim; Secretary, X. A. Willard, Little Falls; Corresponding Secretary, Lester Green, Little Falls; Treasurer, Charles Oyston, Little Falls.

X. A. WILLARD, *Secretary.*

Annual Address.

BY HON. GEORGE W. SMITH

In this assemblage, as in every other, whether gathered for the purposes of business or festivity, the prevailing thought is of the war that is now deciding the fate of us all. However preoccupied, our eyes constantly turn to the venerable image of this free government, framed for the protection of a great people, but now assailed by the fury of conspirators and traitors. A growing reverence for this beneficent free system and this majestic Union, mingling with unspeakable solicitude for their preservation, has lifted the hearts and minds of the American people to sublime heights of exertion and sacrifice.

They see and feel that their struggle is not for themselves alone. While it is in the highest sense maintained for self-preservation, while they know that the Constitution and the National integrity contain the essential guaranties of their civil and material security, and of the continued glory of the American name, they look also with solemn forecast to the fate of coming generations. For them is to be decided, for weal or for woe, the struggle for popular rights which has descended from sire to son through ages of conflict. If in this supreme trial of free institutions republicanism shall fail, where shall we look for more favorable auspices under which the experiment can be renewed?

If we cannot preserve free institutions, they will be impossible for other nations. Now, more than ever, do we fight the battle of human freedom for the world. If we can keep the bow of promise shining clear over the clouds and darkness of this convulsion, if we can preserve this asylum of freedom, we shall keep alive the hope of liberty for mankind—if that sign be blotted from the heavens, if this asylum fall in ruins, there will be an echo of despair in the conscious breasts of devout lovers of human liberty and human progress throughout all the nations of the earth.

We are the recipients and trustees of long descended liberties. Instincts and forms of freedom came from Holland and England. Free institutions that were fashioned and fought for in those mother lands, have been well nigh consummated in this republic. Ours is the work of preserving the sacred legacy. The noble record of freedom's undying war animates us to victorious perseverance.

"The mountains look on Marathon,
And Marathon looks on the sea,"

and above our Marathon, tower all the grand historic heights whereon our English and German ancestors struggled and sacrificed in the cause of constitutional and regulated freedom, and upon this later and greater field they cast an inspiring light. On the field of Marathon, Grecian liberty and civilization were preserved against the barbarism of the East. Along the battle field, whose front reaches from Fortress Monroe to the Rocky Mountains, our loyal people contend for nationality and for free institutions, and uphold the only principles upon which either can exist, by asserting that the federal bond is indissoluble by the States, and that the voice of the majority is the supreme law of a democratic republic. They contend for that nationality, and that master principle of free government against a rebellion which wars upon civilization and strikes at the vital principles of popular freedom—against a system which is based upon an enforced and perpetual barbarism, and maintained by an unsparing military despotism; and this battle field looks out upon the boundless sea of man's future political progress and destiny.

It was, perhaps, pardonable to speak thus far upon this topic on this occasion to an assemblage of farmers, because farmers are the ultimate supporters of this gigantic war. Among them we shall find the most unbiased and dispassionate judgment upon national affairs, the most disinterested love of country, patriotism of the surest instinct and of the most enduring tenacity. Their moral support, reinforcing the government in its day of peril, is no less essential to its success than their organized industry is indispensable to the maintenance of armies in the field. Our government is strong, and strong only in the firm will and magnanimity of the farmers and yeomanry of the country. When those shall fail, the government falls with the paralysis of the nation.

Coming to the discussion of our immediate subject, we cannot fail to appreciate the labors of agriculture as both peculiarly favored of nature and beneficent to man. All of nature's mysterious operations and obvious processes give their infinite fruits into his hands. Nature fills him with plenty, and makes him the almoner of her bounty.

Man's most harmonious life is upon the soil—he is native to the earth. The spontaneous sentiments of his nature ever awaken to welcome the hopeful spring; they expand with the triumphal march of summer, beautiful in its pageantry of color and foliage; they are attuned to the sweet melody of autumnal days, when all nature appears to mourn for the expiring year.

The tiller of the soil, more than any other, holds his inheritance and charge from the Almighty. That labor which is life, and that penal toil and sweat which attended man from the first Eden, were to the end that he might plant and dress unnumbered gardens over the earth. This variety of mountain and valley, hill, and dale, and plain, has been wrought out of chaos through a thousand terrestrial changes, each working to prepare it for the empire of man. And now his culture comes to temper the austere sky, his enterprise rolls back the forest like a scroll, and there appears a more genial sun, until the frozen circle itself seems pushed northward, and abundance smiles where unassisted nature was stern, and niggard, and unfruitful.

The farmer may truly walk with the God of nature, a just man. He may live the true life. For him the vital air, the sun's life-giving beams, the reciprocal play of the earth-forces, which draw life and health from the noxious, the decaying, and the dead, by a perpetual round of miracles of creation and reconstruction—health of body, peace of mind—eye and heart open to the kindly influence of the divinity that stirs through all the aisles of His eternal temple—these are the boons bestowed upon him, these the monitions that kindly intimate the scheme of infinite and eternal things.

No form of artificial life can entirely break our allegiance to nature, the common mother. The statesman, the merchant, the man of affairs or of the professions, in pauses of conflict, and through the dissolving visions that surround him, still hears the murmur of the olden groves—the cadence of the waterfalls that soothed him in childhood—and gazes again along the rural vistas that opened before the eager eye of his first manhood. Thither he hopes to return and spend the last calm hour of existence, ere he rests his head upon the "lap of Earth." The greatest genius of the Romans declares that "a country life is nearest to that of a wise man;" and Gray, in his time "the most learned man in Europe," has left a picture of rural life in his "Elegy" that will enchant every generation that learns to read the English language. No urban grandeur, no pomp of wealth, can boast a poetic tribute that so appeals to the primitive attachments of the human heart. Read it again, and feel that "God made the country, and man made the town."

It is well, then, that you honor the first industrial estate of the realm, by your annual festivals; and the town festival, not less than your State and county displays, deserves your attention and patronage. They are held within sight of the acres you cultivate, and the household smoke floats up to skies that bend over your homes. If any here ask for the monuments of your labors and those of your fathers, you have only to answer in the words engraven in St. Paul's cathedral, which direct those who seek for the monument of its architect to "look around." These smiling fields, these secure and happy homes, a pervading mental culture and public order, these kindly fruits of intelligent labor are fit and speaking proofs of the industry, skill and virtue of three generations of American farmers.

You meet, too, not far removed from the graves of the pioneers, the brave and sturdy, the honest and faithful men who devoted their lives to preparing these fair and fertile scenes for posterity—handing down the useful fruits of their labors not always to their children, but always bestowing them as contributions to the greatness and power of our common country. Who can pass through our agricultural districts, so lately won from the forest and the savage, without gathering in memory even the most unregarded of that generation's dust? More impressive than the aspiring shaft, more touching than the costly and ostentatious memorials of our common mortality, are those too often neglected spots where the "rude forefathers of the hamlet" slept when their work was done.

Town rural festivals have a social value worthy of notice. The feeling of common interest and good neighborhood does not exist now as in the early times. When the whole neighborhood, embracing a wide extent of territory, met to "log" each new "clearing," and to husk the corn crop

raised on it, when all the settlers made a "bee" to build every new log house, to raise every new frame, or to cut out the new road, the social feeling, so universally exorcised, kept alive many generous and liberal sentiments which have disappeared under the process of a selfish refinement, and an exclusiveness that teaches that the chief end of society is to keep each one in his own place. Annual reunions like these will strengthen many social bonds, and enlarge the sympathies, as well as the ideas, of those who avail themselves of their advantages.

These fairs, and the discussions connected with them, bring before the whole community improved standards. If each farmer had before him only the results of his own methods, some might think that nature and his providence had done their best in raising Indian corn at the rate of twenty bushels to the acre, or that they were letting well enough alone by leaving the richest soil of their farms drowned in swamp water for want of drainage, or that it was a fair balance when, by imperfect processes in the dairy house, their swine got whey richer in proportion as he got poorer and lighter cheese. But the comparison of experiences brings to light the best methods, and these become a standard of excellence for all. Farmers, by routine, are thus jogged out of the old rut. They find that land, in its depraved and unregenerate state, does pretty much as it is done by, never adopting the rule of returning good for evil, and that cows require the milk of human kindness, by way of sufficient food and proper care, before they will give much milk of their own in exchange.

In time, we learn to translate the terms "good" or "bad luck" into "good" or "bad management." The successful farmer is found to be one who regards the rationale of nature, while the unsuccessful one sets her laws at defiance. The boundless capacities of nature invite the labor, the diligence and research of man. She measures out her gifts in just proportion to the effort and skill by which they are sought. Enough to maintain a merely animal existence is spontaneous; but all this vast fabric of civilized achievement, all that ministers to domestic comfort, or develops and gives play to intellect, and gratifies exalted taste, is the reward of observant labor. Nature, in her rudest estate, is bountiful; but she has in reserve richer treasures for those who strive, and for those who diligently seek her she has a still more excellent way.

Because nature was bountiful, science came late to the improvement of agriculture. In early ages its productions were thought to be the gifts of various divinities, who gave or withheld according to their caprice. The golden grain was the special bounty of Ceres—just as Minerva bestowed the olive, and Bacchus the vine. The lightnings of heaven were hurled, it was believed, direct from the head of Jupiter, who also, as Jupiter Pluvius, poured the grateful or the untimely rain. The seed grain did not quicken, except by favor of the rural god who kept watch and ward over this process; their sheep and their bees were under the guardianship of Pan, and a troop of frolic fauns brought back life to the fields, and opened with their busy fingers the buds of spring. Over all the operations of nature was some presiding divinity, and, as they were prosperous or adverse, they inferred that the divinity was kindly or malignant. Thus the domain of the farmer was enchanted ground, governed by capricious and supernatural

powers, whose ill-will he sought to avert by sacrifices and incantations. This fanciful superstition was an actual belief, and left no scope for scientific improvement, and agriculture was thus confined to a narrow circle of empiric routine.

But since that time, the physical sciences and chemistry have given to the farmer a new heaven and a new earth. The electricity of the atmosphere, which once seemed a manifestation of the anger of a divinity, he now knows to be an indispensable agent in the scheme of vegetable growth and production. The aerial sea that floats around the earth he finds an inexhaustible treasury of natural wealth; he recognizes in its oxygen, ammonia, nitrogen, so many genii of the air that come at the call of agricultural science to bless the farmer in basket and store. He finds that the carbonic acid which mixes with the air we breathe—from animal respiration, from the combustion of inflammable substances, and from the decay of animal and vegetable matter—is by a beautiful compensating process taken up by the lungs of the vegetable system, and transmuted into valuable and useful forms. Thus the trees that flourish in his woods, or embellish his lawns, the crops that grow upon his fields, the plants and flowers that adorn his garden, are not only the staff of his life, and the delight of his eye, but also so many guardian sentinels that constantly eliminate noxious elements from the air he breathes.

In estimating the capacities of agriculture for improvement, we notice that nature furnishes new resources for every need. Increase of population, creating new necessities, is attended by new and improved productions. It is given to the human mind to perform miracles of development from the simplest germs, by the manipulation of natural forces. There are around us the means of an infinite permutation. We, as yet, know but little what may be educed from combining natural agencies or by turning the forces of nature into new channels. No final limit can be assigned to nature's capacities. She has not only a *vis medicatrix*, by which all casualties and damages to the physical scheme of being are repaired, but also a *vis genetrix*, by which new powers are constantly developed, or by which older ones acquire a wider or more beneficial energy. She contracts or expands her powers as natural needs require. The eyeless fish of the Mammoth Cave are not a freak of nature, but a proof that when her powers have reached the limit of utility, they cease to act in that direction.

We do not know what may be the latent powers of the commonest things. Nature's forces have a latent infinitude, a divine energy attending them, waiting to be used, and it is given to the human intellect to raise the apparent and normal power to unknown powers. In a lower sphere and sense, we see the Australian with his boomerang accomplish wonders that seem wrought in utter disregard of all laws of gravitation, all laws of nature, all mechanics. Yet all is the blind following of an exact law, to which necessity and accident have brought the rude hunter of that newest world. Hurled from his hand, the instrument gyrates in the air, sweeps a circuit, touches the ground, and springs again to the feet of the thrower, or it goes from the hand around a tree and strikes a victim beyond, and all is the resultant of the projectile force, the resistance of the air or other objects, and a peculiar shape of the instrument. This faculty in the human

hand, thus wielding an angular piece of wood, is a miracle to us, but a simple manual exercise to the Bushman. Without the example, we should not have suspected this possibility in the nature of the familiar elements brought into play.

So, too, Berger, the great French billiard player, has such a skillful use of the laws of nature, that under his magical touch the ball goes, returns, deflects, bounds from the table over other objects, until the observer feels that it has become instinct and movable with the will of the player. We cannot comprehend how all is done, but the maze is geometrical, and though we cannot follow it, we know it does not vary anywhere, in the estimation of a hair, from the observance of geometrical and mechanical laws.

Such examples indicate the latent resources which man may command from the common and familiar things which surround him. The practical lesson they teach is that the human mind, concentrated upon one work to which the thoughts are devoted, the senses trained, and the faculties adapted, may accomplish results which appear like miracles by the side of all that had been accomplished before.

Whichever way our vision goes, whether by the telescopic or microscopic road, new worlds, new domains of existence, open to the senses and the intellect.

Around all this actual is the larger if not the infinite sphere of the possible. In this sphere is to be carried on the progress of the race and the bettering of its condition.

In no direction is the field so expansive as that in which are to be achieved the triumphs of agriculture. The full culture of our superficial soil is yet far from being reached. Passing up this valley westward, to Onondaga county, we find that only a small portion of the surface of that rich interval has been made available, perhaps only a fourth part of it, estimating by the standard of what is usually considered good culture. In every part of the country we find in swamp and only partially reclaimed lands the unwrought wealth of our soils, the drainage that has locked up for ages vast stores of natural fertility.

Above and beneath us are other treasuries of the elements of production. The use of certain fertilizing agents, and the growth of certain crops, make the atmosphere render tribute to the intelligent farmer. The subsoil plow bestows upon him a domain below that which was possessed by his ancestors, and nearly as valuable. Systematic and complete drainage enables him to draw his crops from a still greater depth, so that we see that the legal theory, that the proprietor of the soil owns upward to the sky, and downward to the center of the earth, does not give a mere ideal possession. In England, where the science and modes of farming have been carried so much further than with us, government and capitalists loan money on mortgage to farmers for the purpose of under-draining their lands, and these mortgages only operate upon the increase of value effected by such drainage, the value of the land previous to that improvement being expressly exempted. Millions of pounds sterling have been expended in this way, and there is said to be scarcely an instance where this mortgage upon the improved value has not been found ample security, the

farmer being enabled to pay his under-drainage mortgage from the increase of his income, and having left an unincumbered increase of profit thereafter. At this time a large percentage of the population of England subsist by reason of this enhanced production, growing out of bringing into activity another depth of English soil.

In other ages, war armed its chariot with scythes to mow down its bloody swath of men. Now, invention gives to the farmer a scythe-armed chariot that cuts his grass and his grain. The machine shop gives him an army of laborers whose muscles and bones are of wood and iron, so that finally we shall see that the beneficent work of agriculture can scarcely be arrested by the waste and havoc of war.

The steam engine, after quickening all commercial activity, and giving a more terrible energy to war—a tame giant that labors unremittingly to do the work of human muscles, and multiplies upon the mountain and in the valley the power before invoked from wind, and wave, and stream—this device of cunning might, besides ranging over wider seas than the Argonauts ever traversed, will plow broader lands than their geography ever knew. It will thrash, and saw, and grind, it will lift the stream from its valley to irrigate the arid heights, and be found at every task—man's great supplement to the ordinary forces of nature.

In like manner we may supplement the chemical and reproductive forces that work together for the farmer—combine, develop and direct them. Nature only gives intimation of her capacities. She furnishes the alphabet of knowledge and of possibilities. From this, man must frame the language and formulas of science. It is the inspiring idea of all progress and improvement, that by taking thought man's stature may be added unto, beyond any assignable limits. The germs of society, art, science, of all that fabric of civilization that rises above the savage state, were unpromising indications of what has been since developed from them by the genius of human thought, aspiring effort, and the unseen forces which these call into activity. The degree of success in any department of human action must always be measured by the extent of intellectual force and activity employed in it. When farmers as a community shall turn upon their profession the light of all the sciences that illuminate its processes; when they shall make their business a subject of intellectual investigation; when they shall endeavor to make the most of all, even the commonest details of farming pursuits, a success will be achieved which will make for agriculture a new history. Intelligence is not only power, it is the leading, the creative power. Chaos, with the divine thought added, as an element and coefficient, becomes the organized universe. All improvement of natural conditions, all development of nature's possibilities, are effected by bringing the human intellect to the work of inspiring and guiding natural forces. Thought, and accidents stimulating thought, have enabled man to advance from the rude working of native ore for a hunting spear, and from the blind groping for an agent capable of transmuting metals, to results in metallurgy and chemistry which give him houses and ships, roads and bridges and machinery of metal, and an inventory of new substances meeting the thousand demands of his advancing progress, and more valuable than all the golden visions of the alchemist.

A few elements combined, a few forces aptly applied, produce all these miracles. Iron fashioned to contain water and admit of its expansion by heat, and a device to make that expansion a moving power, is the steam engine. The action of an acid on a couple of metals, giving a third a power of attraction, with a means of temporarily suspending that power, is the magnetic telegraph. Then there was only required an armature attenuated to a wire, and a register to mark the signs sent along the new highway of thought.

When agriculture receives the thought that its important office demands, we shall see it also producing its miracles. The field of improvement is boundless. Nature ministers to the farmer, and the most beautiful of the sciences are his handmaids. Botany gives him the history of plants and fruits, and hints for that improvement which is yearly manifested in the production of new and valuable varieties. Chemistry has taken an inventory of the soils, and analyzed the plants that draw subsistence from them, and shown what is needful to be provided for their growth. It shows in what particular a soil needs to be re-inforced, and what elements it has in excess, so that the intelligent cultivator, by combining and eliminating, may make his farm a great laboratory whose operations are guided by as clear and definite laws as are the experiments and results of the chemist.

Geology, too, has a natural connection with agriculture, and invests the formation of rock and soil with a new interest. It shows upon the domain of the farmer open pages in the history of eras before time began. It shows how cosmical changes have prepared a heritage for man. These throes of nature have raised mountain ranges to temper torrid heats, and give needful variety to the earth's surface, without which it would present only a succession of swamps and lagoons. By this science the farmer sees how the limes, marble, granite and coal have been brought into vicinity with iron, and that metal everywhere offered to the forming hand of man. Had the rock strata remained unbroken, the productions of nature must have been meager and monotonous. The soil would have been only the substance of a single rock, instead of the teeming compound formed by the silica and potash of the granite, the clay, and the calcareous and other earths derived from the transition rocks and the organic matter of more recent strata, and which, disrupted and scattered, are by their gradual wasting, perennial sources of fertility.

In early periods the atmosphere was charged with gasses fatal to the higher organizations; but carbonic acid gas was solidified into the enormous masses of limestone or fixed in the gigantic vegetation which is now stored up for our use in the coal measures. Chlorine gas, which human lungs cannot tolerate, has been combined with sodium, forming mineral salt, or has been absorbed in the waters of the ocean. Sulphuric acid has been united with the base of lime to form gypsum. Thus, by the hand of the Great Chemist, noxious elements were transmuted into salutary forces, every agent of formidable change was reduced to a useful power, and the planetary ship that bears us through the ether was divinely provisioned and coaled for its grand voyage along the beaming constellations, whose remoteness makes even their inconceivably rapid flight seem to us like an eternal rest.

Farmers, as a class, are especially favored for gaining a knowledge of the physical sciences, and should at least be familiar with such particulars as relate to their pursuits. Electricity, magnetism, meteorology, the natural history of insects and birds, destructive or favorable to his productions, are daily illustrated to his view within the bounds of his own possessions. Farming should be a highly intellectual pursuit. Those devoted to it have occasion for a wider scope of knowledge than any other class of men. There is enough in its operations to engage the abilities of the most comprehensive minds, and it has failed to be the leading occupation in all respects, only because the intellectual force of mankind has not sufficiently sought it as a field for its efforts. But now, when it is seen that it is connected with the most interesting themes of human research, that the noblest of the sciences illustrate its processes, and that it gives scope and demand for enlightened intellect, disciplined minds and scientific skill, we shall see agriculture inspired with mental power, until it takes position as the most respected, as it is the most important, of human pursuits.

We need to purge the mind of youth of the barbarous prejudice that ranks agricultural as something less honorable than other labor; a truly barbarous idea, which has its primitive illustration in the example of the savage, who, too dignified to work, compels his squaw to raise his corn. Let them be taught the inherent dignity of their occupation, and that by the vigor of constitution it promotes, and the personal independence it secures, farming is the most desirable of pursuits. It is high time that all should discard the idea that farms are so many penal settlements upon which man, with predestined sweat and tribulation, drags out the life of the condemned. Let farmers consider the lessons of nature and science, and behold in their homesteads and fair domains so many favored spots where all nature's forces work together for good to man, and to the abounding consummations of fruit and flower, grasses and grain, and of far more than these—to the rearing and nurture of citizens who are the secure pillars of the nation's safety.

It is not given to man to be a true man without labor. The civilized man and all the arts and achievements of civilized life, are the fruits of human toil. To withdraw labor from that domain would be like withdrawing the divine energy from the material world; all this orderly progress, all the fair fabric of industrious art, would go back to chaos. Cicero, who justified his saying by his own example, declares that diligence and labor are "right royal virtues;" and an ancient maxim says that sloth is the true and peculiar luxury of the slave. Finally, I quote the words of Carlyle: "All true work is sacred; in all true work, were it but true hand labor, there is something of divineness. Labor, wide as the earth, has its summit in heaven. Sweat of the brow, and from that to sweat of the brain, sweat of the heart, which includes all Kepler calculations, Newton meditations, all sciences, all spoken epics, all acted heroisms."

The progress of agriculture refutes the gloomy theory Malthus taught, that the increase of population necessarily outran the increase of subsistence. When we examine the vegetable world, we find in it a principle of indefinite improvability. It is familiar knowledge how our grains were originated; that the hundreds of varieties of the apple have been

improved from the crab-apple; that the pear and peach have been, as it were, created from an equally unpromising origin; that the potato has been developed from a bitter root, and that the cabbage and its congeners have been derived from worthless marine plants. All natural products will give advanced results in proportion as improved conditions are supplied. The premium specimens seen in your fairs show the improved results to which proper culture will carry the whole crop, and the skillful farmer finds that nature has an instinct for progress which invites and seconds his own efforts. Production increases as population becomes more dense, and necessity impels men to combine their efforts and ingenuity, and develop the latent means of production.

As steam power takes the place of that supplied by animals, their food is saved for man, and as this goes on, the steam wagon and steam plow will leave less and less demand for animal power. According to Carey, progressive civilization substitutes vegetable for animal food, and this tendency is most marked where growing wealth and population lead to the drainage and culture of the richest soils, which early cultivators had not the capital to subdue. We see the vegetable world taking the place of the animal, and the boundless mineral world superseding both. Wool and silk are supplanted by cotton, leather by gutta percha and India rubber; coal supplies the place of wood, and enables us to convert forest preserves into remunerative property. The cheapness of Pennsylvania coal is thus bringing into cultivation considerable tracts of land in our own State, which were formerly preserved for timber.

Farming is the material base of civilization. It must feed and clothe these advancing hosts. The ranks of those who perish or waste in the unhealthy toil or exposure of artificial employments must be recruited from the hardy sons of the soil. The giant of humanity, emasculated by exclusion from the life-giving light and air and labor of a farming life, must draw renovating vigor from the bosom of mother earth. And no less what adorns civilization than what sustains it depends upon him who daily sends the bounty of nature to the table of the nations. The vision of beauty does not appear upon the canvas, the thought of genius does not speak from the marble, if the farmer has failed to obey the summons of the seed time and the harvest. The thinker, the inventor, the inventor of new systems cannot open the way for human progress until agriculture has amassed wealth, so as to relieve a portion of the race from the necessity of providing assistance, and thus affording opportunity for concentrated mental effort. A just equilibrium of avocations is essential to the healthful action and progress of society. A State is not merely a herd of human beings, but has its own peculiar life, and needs a symmetrical development no less than the individual man. It has moral and material phases innumerable, infinite members, and infinite labors to perform, each useful according to its necessity and dignified by the result to which it contributes. Farmers in all the walks in which they draw increase from the earth; mechanics and inventors of arts; traders distributing products; philosophers seeking truth in the dry light of pure reason; epic philosophers who unite that truth into living iron and brass; astronomers who challenge and track the stars in their widest wanderings; geologists who, reading earth's pri-

meval records, turn the mighty strata of its rocks familiarly, and dog-ear them like the leaves of a hand-book; physicians tracking with pleased curiosity the most frightful diseases; poets creating that imaginative parallel of history which in the distance blends with it; lawyers who give their lives to the maintaining of the old precedents by which generations have walked safely; Howard philanthropists eager to know how humanity fares, even when stained with crime and crouching in prisons; sanitary reformers who scan the sad experience of poverty in its hovels and by-lanes; men enthusiastic over bugs and beetles, enraptured by a new flower or plant; so various are the pursuits and tastes of man; with such ideas of enterprise and duty are mankind, by a certain due proportion, continually inspired. In an ultimate sense, no one of these is subordinate to the other, but all are co-ordinates, producing the symmetrical result of human society.

The common and domestic life of our people is wanting in some of the genial customs and observances that lend a charm and give a needful coherence to society. Our practical judgments have valued nothing which did not yield material returns. But to add to our material wealth and amass treasure for children are certainly not the only nor the chief duties which we owe to country and to posterity. Patriotism among a people is more essential to a nation than wealth, and patriotism has its root in the love of home and in the intelligence that comprehends the exalted uses and necessities of that at once divine and human creation—the organized state, the blended life of men living in society, and constituting a nation. And without a nation, without a government that can look with equal eye into the face of the whole family of nations, what is wealth or material prosperity? And how long in such circumstances could they endure, even if they were the chief objects of society?

The possessor of the country's soil ought to project his views beyond the span of a single life, and leave enduring evidences that he lived for country, mankind and after generations. Our migratory habits have made us indisposed to do more than was necessary to reap the passing profits of the hour; and the transient possession taken to-day, and relinquished to-morrow, has not had bestowed upon it the regard and consequence that belong to a permanent home. We have treated a farm too much as a common-place machine for making money, and failed to consider it in the higher character of a part of a grand and venerable heritage, where we may lay the foundations of an American home and raise the altars sacred to domestic life; where labor is co-worker with all the grand and gentle influences of the earth and sky. The owner of land should consider his tenure to be under the implied trust fitly to improve and develop its capacities, as part of the public domain committed to his charge, to rear citizens for the protection of the commonwealth, and to instill into their natures that intelligence, good order and public spirit which will enable them to act up to the high demands made by our institutions upon the American citizen.

After our country—that all-embracing idea, whose inspiration fills its patriot heroes and martyrs with exalted veneration and undaunted resolve, which made Warren's lips murmur with his expiring breath "it is sweet to die for one's country," which makes the gallant Holt exclaim, that if his country is to be destroyed by the assaults now made upon it, "the grave

of every earthly hope opens at his feet,"—I say that the next most sacred among secular things is the home and the homestead. Home is an English and American derivative from Germanic ideas and genius. Its accessory relations hardly exist in their completeness elsewhere. No other language has a word which translates its kindly authority, its generous equalities, its domestic bonds, its sweet charities, its serene repose. Strength there learns to respect the rights of the weak, and thence to embody that sentiment in the forms of political and legal justice. The domestic conscience comes with its "still small voice," and speaks to the legislator and statesman with persuasive authority. Beneath these old Gothic arches, refounded and renewed, stand the household gods, guardians over a civil and religious liberty, so often rescued in so many different ages from the tempests of revolution. Thence faith looks to the sky. There social virtues and domestic culture sow the precious seeds of public integrity, pure patriotism and unspotted fame. There close by the bosom of nature the impulses of honor and truth have full play. In these rural retreats is nourished the integrity that frowns upon corruption. Here is developed the public conscience that steadily expels successful vice and venality from the public toleration. Here springs up the renewed and healthy influence which corrects the demoralization and malconduct of public life.

The farm and the home deserve the farmer's first regard. Every improvement, useful or graceful, that is within a prudent use of his means, ought to be made upon the little empire over which he has sway, and on which he trains citizens for society and the State. Land alone does not make a farm, any more than a mere assemblage of human beings constitutes a civilized and refined society. It is only when an American farm is connected with a true home that it attains its highest estate. Then if the little home government be as enlightened as it may be; if industry reign there; if woman gives scope to her instinctive good taste, and withhold not the cunning of her hand; if a morality higher than the law prevails there, then an improving and beautifying influence will go forth hand in hand with the abundant increase that rewards the well directed labor there bestowed.

God sends in priceless bounty, to the poor and the humble, flowers as beautiful and as full of refined suggestion as those he affords for the parterres of the rich. Especially may the farmer's home be radiant with their hues.

No autumn need come to him without its gifts of delicious fruits. Cultivated flowers and plants, protected from winter's frosts and kept green beneath his roof tree, may tend to cultivate a genial and refined temper, and that mimic summer may perpetuate a summer of the heart.

Equally within the means of all are trees, the crowning glory of the landscape. Evergreens to shelter the dwelling from prevailing winds—deciduous trees for summer shade—ought to adorn every homestead. The attractions of the farm may be much increased by covering bare and unproductive heights with all the variety of indigenous trees known to the neighborhood, and planting them on neglected places. Nothing is more pleasing to the eye of the traveler than the avenues of trees along the highways that traverse the farms of liberal minded farmers, yielding or

promising a grateful shade, and nothing is more likely to lead him to look for other marks of the intelligence and thrift of the owner.

And it would lend a picturesque and moral beauty to country life if each family would commemorate the birth of children, and the death of kindred, by planting these living memorials on sacred spots, not to be invaded for other purposes. Let the departed rest there, and let the stately maple or oak, the drooping elm and the evergreen, speak of the living and the dead, and with each vernal resurrection they will intimate the eternal principles of life. Should the farm continue to be held by those who would respect such memorials, and such a custom would invest these cemeteries with a sentiment that all would learn to respect; we should see these cemetery groves throwing their protecting arms over the ashes of the forefathers, and they would inspire the "rural moralist" with a feeling of veneration that would send another genial influence into the currents of domestic life.

Each winter should mature some plan for further increasing the productiveness of the estate, and which may be executed without extraordinary expense. Such a systematic application of forecast and labor will accomplish in a few years the most satisfactory results. Thus the thorough draining of a swamp, the planting of irreclaimable lands with useful timber, may be gradually consummated with the ordinary labor of the farm—labor which might run to waste without some such standing and definite object upon which to apply it.

Most farmers may find utility and an interesting exercise in keeping farm accounts. Commencing with a partition of his lands, with a view to regular rotation of crops, he can open accounts with each field, charging it with the labor and fertilizers expended upon it, and crediting it with its returns. To this he may add a stock account, showing the prime cost of the animals upon the farm, the expense incurred in respect to them, their increase, and so on, to any extent of detail deemed advisable. At the close of the year's operations, these results may be aggregated, as well as the expense, and all other charges upon the farm. This simple process would introduce order and method, it would show what was costing more than it returned, it would show what was expedient to be retrenched, and what might be profitably extended. The mental employment it would afford, and the practical facility it would promote, would not be unimportant advantages.

A diary of events and operations on the farm might be kept in a way to afford present amusement—a record of permanent interest. The history and results of experiments, citations and references to such topics in agricultural books and journals as are likely to be of practical value, are a few of the multitude of subjects which would give not only a moral charm, but intrinsic value to the pages of an agricultural diary.

To this might be added a diary for reflections upon topics relating to town and county affairs, upon subjects of wider interest in the State and nation, and upon points suggested by observation, study, or domestic discourse. To this the children and youth of the family should be encouraged to make contributions; these various means would be a stimulus to thought, and a mental exercise and discipline of the highest value in preparing all the members of the family for the discharge of their duties to society and their country. Along with these should be filed and preserved one or more of

the local journals of the county, together with one of a wider scope, indexed as to matters of peculiar, general, or local interest, and the whole kept with care, as domestic archives, illustrating the history of the farmer's family, town, State and country.

When farmers yield such a devotion to their noble calling—when they shall unite its exercise with an intelligent comprehension of principles—when they thus surround its most irksome duties with the halo of a mental illumination—when they shall regard the farm homestead as supremely worthy among secular things, they will make manifest the true dignity of agriculture, and attach their offspring to the soil. Their vigor and intellect, no longer unduly dissipated in cities, or in the pursuit of the infrequent success gained in the professions, no longer misapplied to "unmanly arts beneath their care," they will go forth, proudly conscious of the grandeur of their occupation, carrying with them the lessons and influences of a true American home, each raising up on our hillsides and plains a new altar devoted to intelligent industry, and a new rampart of his country's defence. Then will succeeding generations of farmers furnish not only a high degree of agricultural prosperity, but the best type of the citizen, a healthy public spirit, and a high political morality. Thus the rural homes of America may be made perennial fountains of a conservative force, by which patriotic sentiment, a pure public spirit, and a hatred of corrupt arts, may be constantly renewed. Thence may come the influences that will give a new lease to national existence, influences which will be felt as heretofore, and more than hitherto, in the legislation, professions and policy of the country.

So may be preserved, for our society and congratulation, that contrast which we present to the nations of the old world; a contrast that shows, unlike those nations, a vital public spirit and controlling public opinion among the farmers of our land, which make them the active and intelligent arbiters of the nation's destiny, predominating over the pernicious influences of great cities, correcting their excesses, and renewing with new blood, and brain, and muscle, the waste of their artificial life.

These influences, and the industrial army organized behind the government, are its indispensable supports. After eighteen months of war, and an unparalleled expenditure of resources, we behold not exhaustion, but advancing energy. Our lakes and canals are thronged with myriad vessels, that bear away the productions of an untiring industry. Our railroads groan beneath the burdens laid upon them from the farm and the workshop, the forest and the mine. The abstraction of a million men for war seems only to have awakened our industrial activity; our natural equipoise seems hardly disturbed by the most formidable rebellion ever recorded in history. The tolls of yonder canal will probably amount, for the current year, to five millions, the receipts of that railroad will probably reach ten millions.

Should the energies of the industrial armies of the farm and workshop relax from their labors, the paralysis would reach the ranks of the soldiery and every ship of war. The waving oceans of grain that overflow to fill the ship and rail car, the herds upon a thousand hills, the dairy that turns the grasses of the landscape into gold, and the many forms of agricultural

wealth, are among the final reasons why we shall prevail against this rebellion.

The workshop that gives you labor-saving implements—mowers, reapers, and the like—liberate tens of thousands for the ranks of the army; the sewing machine enables the women of the country to clothe these immense armies, and thus a few mechanical expedients assume an importance above the boasts of diplomacy in the cabinet, or the triumphs of strategy in the field.

Thus we carry on a mighty war without shipwreck to society, preserving to the loyal States the peaceable fruits of their labor, because our farmers on all their broad domains provide sustenance and raiment for our gigantic armies both in the field and the workshop; and pour out from the seaboard fleets bearing grain and dairy products to aid in feeding the nations of the old world. War for us does not mean famine, nor pestilence. It is the heroic remedy of Providence for the regeneration of a nation, and the cure of evils that no remedy less terrible could reach.

If we raise our eyes from the scenes of perilous confusion and strife that afflict our country to the grand historical movement which constitutes the progress of man, we may feel assured that this civilization, this liberty, these free institutions will survive in progression. Had man witnessed the convulsions of our globe which upheaved its solid crust into mountain ranges, and scooped out the cavernous depths of its oceans; had he seen fire and water contending for destructive mastery over its whole surface; had he seen whole systems of animal and vegetable life crushed in the roar of a universal chaos, he would have thought that nature herself was perishing in those wrecks of the material world.

But could he have extended his gaze, he would have seen that existing forms, having fulfilled their appointed office, were being removed to give place to improved forms. He would have discovered that new and constantly progressive creations followed each great geological change, and that great changes were the harbingers of great improvements. He would have seen that these convulsions brought forth that salutary order which was necessary to be prepared before man, the "consummate flower" of all these terrestrial revolutions, could be invested with the image of his Creator and endowed with the sovereignty of the earth.

Thus surveying the mighty processions of those primary ages when nature seemed so often carried to her tomb, but beholding also all those majestic resurrections, it would have appeared that improving progress is the ultimate result of all natural change. Over all the surges of these amazing agitations, he would have seen written everywhere the designs of the Deity, immutable in the law which ordains that from the disturbance of every system, and from the grave of all created things, there shall arise a more magnificent creation, and a nobler and more exalted existence.

LODI.

The sixth annual fair and cattle show of the Agricultural Society of the town of Lodi was held on the 3d and 4th of October last. The weather for a few days previous to the fair was good, and preparations had been entered upon for a grand exhibition by both managers and exhibitors.

The ladies had festooned and decorated floral hall beautifully and tastefully with evergreens and flowers, and exhibitors vied with each other in arranging their articles so as to produce the most pleasing effect. There were three hundred and seventy-five entries made by the different competitors.

The display of single and matched horses was perhaps not as large as at some of the previous exhibitions, but was entirely creditable to the society.

The display of cattle, swine and sheep surpassed all previous exhibitions, while the hall teemed with beauty. Grains, fruits, flowers and vegetables were exhibited in profusion, as we had been blessed by Providence with an abundant crop. In domestic manufactures of every branch the display surpassed every previous exhibition; but after arranging everything in its place, and while the hopes of all were buoyant with the prospect of a valuable and successful exhibition, a sudden change in the weather warned us of an approaching storm, that came upon us with a cold and chilling wind, and lasted for three or four days, thus damaging financially what had promised to be the best and most successful fair the society ever held.

The receipts and disbursements were as follows:

Amount of cash on hand January 21, 1868	$51 59
Received at fair October 3d and 4th	137 90
	$189 49
Paid for premiums and expenses	$210 15

Leaving a debt of $20.66 against the society, to be paid another year.

Officers for the year as follows: President, James Flood, M. D.; Vice-President, John J. Chapman; Secretary, James Van Hornè; Treasurer, M. B. Ellison.

JAMES VAN HORNE, *Secretary.*

Middlebury.

Your circular was handed me by a former secretary of our society, from which it would seem that the requirements of the law, with regard to auxiliary societies, have not been complied with, and requesting attention to the same.

I was not connected with the society at its organization, but knowing the men who were principals in the movement, I can hardly conceive of such transaction and subsequent communication with the State society, without a compliance in all respects with statutes for such cases made and provided.

The time is now so near at hand in which a report is required, that I can, perhaps, do no more than to transmit to you the articles of constitution of our society, with some general remarks touching its transactions down to the present.

Wyoming, Wyoming County, N. Y., *February* 17, 1858.

We, whose names are hereunto added, inhabitants of Middlebury and vicinity, for the purpose of promoting the science of agriculture and other branches therewith connected, do hereby form ourselves into a society, to be governed by the following constitution:

Article 1. This society shall be called the Middlebury Agricultural Society.

Article 2. Any person may become a member of this society by adding his name to this constitution and paying one dime.

Article 3. The officers of this society shall be a president, vice-president, secretary, treasurer and three directors, all of whom shall constitute an executive committee.

Article 4. The president shall preside at all meetings when present. The secretary shall keep a record of all proceedings, and all the papers of the society. The treasurer shall have the care of the funds of the society.

Article 5. The executive committee shall have power to appoint all other committees necessary, shall call meetings of the society when a majority of said committee shall think it expedient, and have the general supervision of the business of the society.

Article 6. Members of this society, appointed on committees of investigation, shall obtain all the information in their power, and report the same in writing or verbally to the society.

Article 7. There shall be an annual fair of the society, held at such time and place as the executive committee shall designate, for the exhibition of stock, farming utensils, and the products of the farm, garden and shop, under the direction of the executive committee.

Amended November 17, 1860:

Article 7th of the constitution was so amended as to leave it optional with the society at large whether or not to hold an annual fair.

Article 8. All exhibitors at the annual fair shall give a full statement with regard to the articles so offered—as to breed, age and raising of animals; manner of cultivation; producing and manufacturing articles, and the expense of the same.

Article 9. All persons presenting articles shall conform to the regulations of the society.

Article 10. The officers of the society shall be appointed at each annual meeting, and shall hold their offices until others are chosen in their stead.

Article 11. This constitution may be altered or amended at any annual meeting of society, by a vote of two-thirds of the members present.

At a meeting of the citizens of Middlebury and vicinity, at the house of J. Newell, in Wyoming, on the the 16th February, 1858, the preceding constitution was unanimously adopted and signed, after which the society proceeded to elect officers.

The following persons were duly elected: A. W. Blackman, President; James W. Quale, Vice-President; W. Cheney, Secretary; J. H. Gould, Treasurer, and three directors.

Some half dozen meetings were held in the town up to the 17th of July following the organization of the society, at which time arrangements were made for a fair to come off on the 5th of October following, which is reported as a commendable exhibition.

The meetings for the next year were frequent, and usually enjoyed the advantage of appointed addresses, together with discussions upon subjects previously given out; and a second annual fair was held on October 14th, 1859, exceeding the expectations of the most sanguine.

The next society year, embracing parts of 1859–60, was one of interest, as regards meetings, and arrangements were made for holding a fair; but for some reason the place was changed at a subsequent meeting, yet notices, &c., had proceeded so far that the matter became so much confused that it was deemed best by the executive committee to let it pass over.

The meetings of the society were frequent and well attended for the year, embracing parts of 1860–61, and were varied in their exercises between addresses, discussions, and readings from works, illuminating the subjects under consideration; and though there was no annual fair, yet according to arrangement, on March 28d, 1861, there was at the meeting of the society an exhibition of fruits, garden and some other products, &c.

The year embracing parts of 1861–62, had some good meetings, at several of which the question of "educated labor" was discussed, led by Prof. M. Weed, of Wyoming Academy, in the course of which he introduced articles from the North American Review. The receipts of this year were much less than those of any former one, consisting only of a small amount of membership fees; and the meetings were limited in attendance, embracing for the most part the few who, in spite of the war interest, continued the investigation of agricultural interests. During this year the society received the valuable addition of twenty volumes to its library from the New York State Agricultural Society, which should, if they were not, be duly acknowledged. Of previous receipts of books I am not able now to speak. The library now consists of seventy-five volumes, twenty-nine of which are Transactions N. Y. State Agricultural Society, and twenty-nine volumes Transactions American Institute.

The society's year for 1862–3, upon which we have now entered, has, as yet, little to report, except its new board of officers, as follows:

President, Linus De Wolfe; Vice-President, F. W. Copwell; Secretary, E. Owen; Treasurer, W. R. Keith; Librarian, I. H. Gould; Directors, A. Smith, J. Newell, C. L. Hayden, H. M. Choate, and H. J. Reddish.

The war interest is yet absorbing everything else, so that but little has been accomplished, save the interchange of views upon some subjects between a few members; but it is the intention of the board to procure some profitable discussions, and a respectable fair next fall.

With many thanks to the State Society for their past favors, trusting that they will not forsake us in our "day of small things," and hoping to be able to make more suitable acknowledgments and give a better account of ourselves in future, the above is most respectfully submitted.

E. OWEN, *Secretary.*

MORAVIA.

At a regular meeting of the Moravia Agricultural Society the following officers were duly elected for the coming year:

John Stoyell, Moravia, President; Thompson Keeler, Moravia, Treasurer; M. L. Everson, Moravia, Secretary.

Receipts, $174.50; expenditures, $137; balance, $37.50.

M. L. EVERSON, *Secretary.*

Moriah.

The fifth annual fair of the Moriah Agricultural Society was held in October, 1862, and the exhibition was a creditable one to the society. The receipts during the fair were $332.47; expenditures, $315.08; balance in treasury, $17.39.

Officers, 1863: J. A. Lee, President; E. B. Titus, Secretary; George Sherman, Treasurer.

Otisco Farmers' Club.

The Otisco Farmers' Club report that they held their first annual fair on the 23d day of October last, at which premiums were awarded by said club. This club meets Monday evenings, weekly, for the discussion of the different questions of agriculture, horticulture and mechanic arts, etc. This club raised, by membership and subscription, $77.50; there has been expended for rent of, and erecting fixtures on fair ground, $60.00; for printing and books, the sum of $12.00; also for cards and badges, and incidental expenses, $5.50. J. H. REDWAY, *President.*

Amber, *December* 15, 1862.

Rosendale, Ulster County.

The second annual fair and cattle show of the Rosendale Agricultural Society was held on the grounds of the society, on the 16th, 17th and 18th days of September, 1862. The grounds of the society are situated on Rosendale plain, consisting of thirteen and a half acres of level ground, inclosed by a tight fence seven feet high. A fine track, half a mile in length, encircles the ground. There are on the ground tight box stalls for twenty horses, and a number of pens for sheep and hogs, etc. The grounds are as fine as can be found for holding town fairs upon. As it is, it cost the society $2,200, of which the society still owes $700. The society had a large canvas hired from the county society, 100 feet long, and a table under the canvas the full length; and a separate canvas for poultry, rabbits and agricultural implements, etc. The first day of the fair was rainy, and prevented many from arriving in time to make their entries. The display of horses was good, particularly the horses entered for the different trials of speed. The show of double teams was fine, and attracted much attention. The show of cattle was fair, some fine Devons and Short Horns being on the ground. The sheep attracted much attention, and the show was good. The show of agricultural implements was not so large as was expected. The display under the canvas was very fine. The fine painting and needlework of the ladies attracted much attention. The show of poultry and rabbits was good; the Madagascar or lop-eared rabbits of S. P. Keator, Rosendale, were the finest specimens ever exhibited at any of the fairs.

The amount of premiums paid out was $200, and a number of agricultural publications that the society gave as discretionary premiums. We would like to get a small share of the Transactions of the State Society, if we can. I should like to distribute them amongst our farmers, to renew their

energy to make the land produce to its fullest extent. The farmers in this vicinity seem to be awaking to their real interest in agriculture. In behalf of our society I tender thanks to you for your labors in behalf of the State Society. SIMON P. KEATOR, *Secretary.*

ROSENDALE, *November*, 1862.

SKANEATELES FARMERS' CLUB.

I herewith respectfully submit the report of the Skaneateles Farmers' Club for the past year.

For reasons well known, it has not been expected that the past season would prove favorable for the best promotion of the peaceful arts; so that if there is anything unexpected in connection with the labors of our society for the past year, it must be in that we have been so little disturbed by the commotions throughout the country, and so far successful in sustaining the interest and usefulness of our organization, as we think our report will show.

Our club has this year been sustained by 87 paying members, about the usual number having been engaged in the active duties of the society. During the past year a considerable addition to the labors and expenses of the society has been incurred by the necessity of having to remove our Fair building, a structure one hundred feet in length. Much effort has been made to have it established upon a permanent site, but owing to the difficulty of obtaining a situation in all respects pleasing and suitable, as well as owing to the critical state of the times, the building has finally been again erected upon leased ground, a very suitable lot of eight acres, for a term of five years.

As formerly, regular meetings for lectures, essays and discussions were held each week last winter with very good success, yet leaving a good margin for improvement. During the summer, meetings were held regularly each month, with the intention of better sustaining the interest of the society; and various special meetings have been called from time to time for the necessary transaction of business. But, owing mostly to the unusual scarcity of farm help in our vicinity, as in most parts of the country, some of our meetings appointed in the busy season have been very poorly attended, rather suggesting the impropriety of endeavoring to hold regular meetings during the busy season.

A fruit and floral exhibition was held under the auspices of the club in the midst of the strawberry season, with gratifying success; exerting, as is believed, an important influence for the producing and improvement of small fruits, flowers and early vegetables.

The eighth annual fair of the club was held at Skaneateles October 7th and 8th; and, while no side exhibitions were present to claim a share of the attractions, it is believed to have called together nearly or quite as large an assemblage of people as any former exhibition, and all seemed to consider it worthy of the gathering.

As in former years, the exhibition was made free to all, both exhibitors and visitors. The number of entries (646) shows a falling off from some previous exhibitions, yet in some departments it has never been excelled here, in either variety or quality. Especially was this noticeable in the

departments of fruits and vegetables. Among the latter may be mentioned the article of potatoes as particularly worthy of notice, of which alone there were 58 entries, including 28 different varieties, nearly all of very superior quality.

The exhibition of stock, of all kinds, was deficient in numbers; but in quality, fully up to former times. The show of horses was sustained by some of the best animals exhibited at our former fairs, with some very fine additions. In the cattle department, among other thorough-bred stock, were two Durham bulls, four years old, of fine form and formidable bulk, which attracted much attention; exhibited by A. J. Dwinnells and H. M. Stone, of Marcellus. Of sheep, there were some good samples of coarse and middle wool; and of Spanish Merinos, the favorites of our section, there were some very superior pens exhibited by L. A. Sweet and J. T. Morse. The department of swine was represented by imported Yorkshire, Leicester and Chester county breeds.

In order to fully account for our decreased number of entries, one more deficiency should be noticed, which may be readily explained, and, as we believe, fully excused. It was in these departments of exhibition hall which have been heretofore so well decorated or substantially filled by the contributions of the ladies, who upon this occasion deemed it most proper to exhibit their patriotism, humanity and business sagacity, and to employ their time and energies in getting up and superintending, on the fair ground, a refreshment tent, under the name and auspices of the Skaneateles Ladies' Aid Society for the relief of sick and wounded soldiers. It may be proper to add that the effort of the ladies resulted in most gratifying success—the receipt of $225.

In the afternoon of the second day a practical and scholarly address was delivered by Rev. D. K. Lee, of Auburn, on the "Hand-work, Head-work and Heart-work of Life," which was appreciated by a large audience. Though it came not from the lips of a practical farmer, it seemed to flow spontaneously from the heart and brain of one who thoroughly understands and appreciates the farmer's vocation, and would ennoble and improve it.

Without dwelling upon details which are much the same at all agricultural fairs, suffice it to add that our last exhibition was considered a decided success, entirely upon its own merits.

A much smaller number of diplomas will be given out by the club this year than formerly; in explanation of which it may be stated that many persons who have heretofore received the club's diplomas do not care to receive more of them, though they continue to support our fairs by the exhibition of superior articles or stock. And such seems to be the necessary result generally of giving diplomas, however expensively and finely they may be executed. Consequently our diplomas are filled out for those only who signify a wish to receive them, or given wherever it is believed they will in any degree promote our cause, among those to whom they are awarded.

So soon as the financial state of our society will allow, probably the majority of the club will be favorable to giving small premiums, not in money, but, as has been several times recommended by different individuals, premiums in the form of books, periodicals, or articles of some kind which

shall avoid monotony, and furnish, at small expense, something useful, and in itself worthy of preservation. Receipts, $199.16; expenditures, $260.11.

I herewith send you a list of the officers of the Skaneateles Farmers' Club, elected at its annual meeting held January 3d, 1863: President, Geo. H. Bentley; Recording Secretary, Chauncey B. Thorne; Corresponding Secretary, Squire M. Brown, Elbridge; Treasurer, William J. Townsend.

C. B. THORNE, *Secretary.*

Thorn Hill Farmers' Club, Onondaga County.

On the 8th of November, 1862, the Thorn Hill Farmers' Club organized, under the law of 1855. No fair was held after the organization, consequently we have little to report, and the President, Mr. Sidney Smith, suggested that a simple statement of facts by me would be sufficient.

We number fifteen members; have at present weekly meetings, which are of much interest; are having a regular course of popular lectures.

Thorn Hill is not a village place, but simply an enterprising community, and the club pleases and encourages all who have taken hold of it. It seems to supply a want which heretofore was but partially realized. It will live and succeed, rest assured.

LEWIS SPAULDING, *Secretary.*

The account of the sheep show at Thorn Hill was received as the Transactions were being printed, and we give this report from Mr. Spaulding, the Secretary; and would recommend to other town societies to adopt a similar plan, for giving interest to their societies, and securing great good to the farming community.

SHEEP SHOW AT THORN HILL, ONONDAGA COUNTY.

The idea of shearing sheep at an exhibition is a novel one, and those who projected this show were naturally a little nervous as the 4th of June dawned. A cold, sour day would have decided against the show, but nature smiled on the project, and early in the day men from various parts of the county, and also from Cayuga county, arrived, and made themselves on good terms with all they met. Never have we seen an assemblage composed so exclusively of substantial, enterprising and progressive farmers. There were also merchants, manufacturers and bankers from the city and villages, for the day, the ride, and the country were all delightful.

There were over 60 sheep on exhibition, brought by 40 exhibitors. It would be impossible to tell how many personally examined and decided on the relative merits of the different sheep, but a very large number certainly.

Considering the number of sheep, and that the committee were not prepared to act till afternoon, it was impracticable to shear them all, and it was decided to select the best in appearance, to be examined by weighing and shearing. In the absence of Hon. H. S. Randall, of Cortland, Mr. Edmund Clapp, of Pompey, was associated with Messrs. Ellis and Geddes, as judges. The decision of the committee was given by Mr. Geddes, with explanatory remarks.

The first class included rams of full age. The first best in this class was that owned by Dr. I. Morrell. Weight before shearing, 115 pounds; fleece,

15 pounds 7 ounces—making the fleece over 13 per cent. of the entire weight.

Second best, owned by A. S. Harrington. Weight before shearing, 118 pounds; fleece, 12 pounds 5 ounces—making 10½ per cent.

Third best, owned by Silas Wright. Weight before shearing, 150 pounds; fleece, 15 pounds 2 ounces—making 10 per cent.

All the sheep in this class are owned in the vicinity of Thorn Hill, by members of the club.

The second class included yearling rams.

First best, owned by E. E. Browne, New Hope, Cayuga county; sheared 14 per cent. of its entire weight.

Second best, owned by Lorenzo Sweet, from the town of Skaneateles; sheared 10 per cent.

Mr. Sweet's yearling ram was spoken of by the committee as being one of the most perfect form, and giving wool of a quality the most satisfactory to manufacturers.

Mr. Browne had a ewe of matured age that sheared 15 per cent. Also yearling ewe, one of a pair of twins, weighing 54 pounds, which sheared 9 pounds 5 ounces, or 17⅓ per cent.

There were sheep on exhibition with much heavier fleeces than those examined by the judges, some of which were sheared and weighed.

Mr. Seneca Hunt's ram sheared a fleece of over 19 pounds. Mr. H. Armstrong, of Marcellus, presented a fleece, previously sheared, weighing 21 pounds. The seven ewes brought by Mr. Munson, of Otisco, were universally admired. The four yearling rams of Mr. Sweet were, all things considered, inferior to no animals on exhibition. But to notice in detail all that were worthy of "honorable mention," would be to go through nearly the entire list. The greatest benefit arising from this exhibition is not in what is said or written of it, but in what was seen, in the general information obtained by personal inspection, and the decision of each man in his own mind.

Mr. Geddes expressed himself entirely pleased with the exhibition, and said he had never seen so good a collection of sheep at any fair or agricultural exhibition. There was not an inferior sheep in the collection, and not one that would not have taken the first premium at the State fair held at Watertown a year ago last fall.

The affair was unqualifiedly a success; and though the managers felt that in many respects it might have been better, there was nothing but congratulations on our success heard from visitors or contributors to the exhibition. L. S.

Vernon, Oneida County.

The Vernon Agricultural Society, which was one of the first town organizations in the State, has not performed its mission for the past year so well as in former years.

Although there is no lack of zeal in behalf of agricultural improvement with the great body of its members, yet circumstances beyond control prevented an exhibition the past year. The preliminary measures for holding the annual fair were duly entered into, a tent negotiated for, and all the

enthusiasm enkindled to insure success, when a sudden damper enshrouded our anticipations by the persistent call of men for the common defence of our national government, and which was responded to with an alacrity worthy of the people, and which seemed to be the absorbing topic of all, and left no thought of home pleasures or improvement—to such an extent as to amply justify the officers of the society in postponing the fair to another year.

The officers of the society for the present year are as follows:

President, Josiah Case; Vice-President, Henry Wilson; Treasurer, Everett Case; Secretary, Levi T. Marshall—with four directors.

I herewith send a review of the agriculture of the town.

The town of Vernon is situate upon the extreme southwest border of Oneida county, adjoining the county of Madison.

This town was the home and play grounds of the old Oneida tribe of Indians; the home of the old Chief Shenandoah, whose life exceeded somewhat one hundred years, and whose remains repose in the cemetery grounds of Hamilton college, and placed there at his own request, that he might rest beside his spiritual adviser, Dominie Kirkland. A few of the old Oneidas yet remain in town, but only a sad remnant of that once noble and powerful tribe.

All that portion of land formerly occupied and held by the Indians was of the best quality, but neglected and allowed to run to waste under their indifferent mode of farming. Nearly all has now passed into the hands of successful farmers, which scarcely leaves a trace throughout its borders of the savage or his wigwam. The geology of the town gives us the Clinton, Niagara and Onondaga salt, water lime and limestone groups of rock, or shale, as the terms imply. The situation and elevation of the lands give evidence of those great sweeping currents which have fashioned the face of the globe, and left much or little of those vast deposits of rock, shale, coal and earth, and which crop out as an index to the worth of the overlying soil, for productive purposes. The streams flowing through the town, from south to north, are the Oneida, Shenandoah and Dean's creeks. The northern portion of the town is quite level, with a tenacious clay subsoil, producing grass and oats, and adapted to dairying purposes; while the southern portion of the town is quite undulating, and the type of the most of that section of the State south of the Erie canal, as you travel westward, with a continued undulating surface of hills and valleys, with streams flowing northerly to the Mohawk, Oneida lake and Lake Ontario. The Oneida creek forms the dividing line of Oneida and Madison counties, along the interval of which is much good land; and along this stream is the farm of the "Oneida community," of about 600 acres, which bears the mark of most thorough tillage and improvement in all the branches of agriculture, horticulture, fruit culture, flora culture and green house products, besides many mechanical wares. These lands being highly cultivated, are also highly attractive, and annually have thousands of visitors to view them. The "Oneida community" now consists of about 200 persons of both sexes, old and young, who all reside in one family, and who have lately erected a very stately brick edifice, at a cost of several thousand dollars, and of sufficient capacity to accommodate all, and double or triple

their number, which seems to be an innovation upon most modes of living. Their religious tenets are of a creed peculiar to themselves, promulgated by Rev. J. H. Noyes, who is the founder of this sect and institution.

The Oneida and Shenandoah creeks form a junction near their passage under the Erie canal, and add to the waters of Oneida lake, while those of Dean's creek flow to the Oriskany creek, and from thence to the Mohawk. The southern and western portions of the town, which are underlaid by the Onondaga salt, water lime and limestone formations of shale and rock, consist of land of good quality, and produce good wheat, and all the various kinds of grain, as well as good grass. Considerable quantities of cheese and butter are produced in this town, and of excellent quality.

There was one cheese factory built the past season, and proved a success, and two more are in preparation to be erected early in the spring. This mode of manufacturing cheese will doubtless become general in all dairy districts. The first of these enterprises was entered into by Mr. Jesse Williams, of Rome, whose reputation and success are proverbial throughout the State.

This town formerly furnished large quantities of the best kind of Saxony wool, but the business has of late been superseded by that of the dairy.

Considerable attention is paid to the raising of fruit, such as apples and pears and the smaller fruits. Peaches have become nearly extinct, from the effects of the cold winters. Considerable quantities of hops are produced; also some teazles and tobacco. The elevation of the town is about three hundred feet above the Erie canal at Rome and Utica. The crops the past year have been lighter than usual, on account of the severe dry weather in spring and early summer. Fruit was abundant and fine, but sold at low prices. The favorite cattle in this town are the Devon and their grades, and were introduced here forty years ago, from the stock of Messrs. Hurlburt, of Litchfield county, Connecticut, with later additions of the same breed.

The law for the collection of agricultural statistics has been met with rather an indifferent response in this section, by the people, and also by those who were expected to aid in carrying the law into effect. There has been a *cormorant* desire, for the past two years, of people to *serve their country* in official stations, where there was *considerable pay*, with but *very little to do;* but the collection of agricultural statistics was not of that order, and scarce was any so poor as to do it reverence, or render it aid—as it is only *money* that makes the mare go.

L. T. MARSHALL, *Secretary.*

Wilson Agricultural Society.

The annual meeting was held on the 8th day of April, 1862, at which officers were elected. President, Benjamin Farley; Secretary, Ezra S. Holmes; Treasurer, Benjamin Dearborn.

A resolution was adopted admitting the inhabitants of the towns of Porter and Newfane to competition at our next annual exhibition on the same terms as members of this society.

We regret that all-absorbing matters of national interest, together with a general apathy among farmers and mechanics as to their own best inter-

ests, have prevented the holding of any club meetings during the past year, for discussions on agricultural and kindred subjects, by this society.

The annual exhibition was held at the village of Wilson on the 9th and 10th of October, 1862. The weather was unpropitious, but the number of entries was fair, and the quality generally good. The first day was devoted to the exhibition of stock, and the second to all other articles included in the list of premiums. On the second day an address was delivered by J. N. Sawyer, of Wilson.

EZRA S. HOLMES, *Secretary.*

Brockport Union Agricultural Society.

The annual meeting of the Brockport Union Agricultural Society was held at the office of H. N. Beach. There were about the same number of members present as at previous annual meetings. President E. B. Holmes occupied the chair.

The President announced as the first business in order the annual report of the Secretary, which was called for and read as follows:

SECRETARY'S REPORT.

To the President and Members of the Brockport Union Agricultural Society:

Gentlemen—Since the last annual meeting of the society there have been six meetings of the board of managers.

The "spring exhibition" of the society was held on the 4th of July, consisting of flowers, butter, horses and sheep. The exhibition was pecuniarily quite successful, and the display in some respects highly creditable to exhibitors, but not so fine in all respects as that of the previous year.

The annual fall exhibition was held on the 26th of September. Owing to a combination of circumstances, the fair was partially a failure. The war had taken a large number of laboring men from mechanical and farm labor into the military service, rendering it imperatively necessary that every man or boy that could work should do it. This fact, together with the other and more detrimental fact that the State fair was soon to be held, and that a large portion of those whose time would not admit of their attending both fairs chose to attend the State fair, thereby rendered the exhibition of this society less successful than it would have been under other and more favorable circumstances. It may be some consolation for the members of this society to know that, even as unfortunate as it was at its last exhibition, as compared with other like societies throughout the State, it was successful. Nearly all the agricultural societies at their fall exhibitions failed to pay their current expenses.

All of which is respectfully submitted.

H. N. BEACH, *Secretary.*

Receipts	$677 32
Expenditures	636 51
Balance	$40 81

Officers elected for 1863: F. P. Root, President; H. N. Beach, Secretary; George B. Whiteside, Treasurer.

It was resolved to hold a spring exhibition of the society.

FARMERS' AND MECHANICS' CLUB, OF CLAY

The annual fair was held on the 23d and 24th of September, 1862. The attendance was large, and the different articles of agricultural produce and mechanical art on exhibition were very fair. The agricultural interest in the town is on the increase, and many improvements are being made in the culture of the soil and in the raising of cattle, horses, sheep and swine.

DANIEL SCHOOLCRAFT, *President.*

JOHN F. HARDEE, *Secretary.*

DELHI AGRICULTURAL AND MECHANICS' SOCIETY.

The president, secretary and treasurer of the society make the following report, in conformity to chapter 425 of the Session Laws of 1855:

The society was organized on the 8th day of March, 1862. There has been realized from subscriptions for memberships and otherwise, since its organization, $947.65. Expenditures, $926.21—leaving a balance of $21.44.

The society own a trifle over six acres of land, well located for its uses, and which is nearly paid for, there being something over one hundred dollars unpaid, which is all its indebtedness. As the fences and buildings are all new and in good repair, the expenses of the society will be proportionably light for several years.

But a small portion of the premiums awarded were called for, the individuals entitled to them generously donating the amounts to the society, thereby enabling it to very much reduce its indebtedness.

Since its organization, the society have held meetings at short intervals for the discussion of agricultural subjects, which it is believed have resulted in good.

The first fair was held on the 8th and 9th days of October last, and was well attended. The exhibition of stock, products, fruits, vegetables, agricultural implements, ladies' handiwork, &c., far exceeded the expectations of the most ardent friends of the society, taking into consideration the short time it had been organized, and the disadvantages it labored under in preparing the grounds, erecting buildings, pens, &c.

In addition to the usual business and duties of such societies, it has inaugurated a sale day for the sale and exchange of stock of all descriptions, which bids fair to be beneficial.

Although the name of the society would indicate that its operations and benefits would be confined to a single town, that is not the intention, but, according to its by-laws, any and all the adjoining towns are permitted and solicited to become members and participate in its proceedings.

We deem the society in a very flourishing and prosperous condition, and expect to extinguish its small indebtedness during the coming year, besides being able to pay a larger amount of premiums or add to its grounds.

EDMUND ROSE, *President.*
NORWOOD BOWNE, *Secretary.*
ANTHONY M. PAINE, *Treasurer.*

DUNDEE.

The undersigned would respectfully report, that this society was organized in 1856, and called the "Dundee Union Agricultural Society," and

held its annual fairs at this place; but upon examination it was found that the requisite certificate of organization had not been filed as required by law, and that there was no record of any moneys received or disbursed, by any treasurer, prior to 1861; and from the confusion in which the society was then drifting, although well sustained, it was reorganized; and for the last two years, notwithstanding its hall being consumed by fire in the spring of 1861, and the necessity of an extra expense of about $500 to build a new one, and with a full record of its proceedings, and a system in its management, the annexed current account will fully attest its prosperity. The society now stands free from any debts, and bids fair, with the same public spirit manifested as heretofore, to become a fixed institution.

Our fair was held at the village of Dundee, on the 15th, 16th and 17th October, 1862, and well represented in its several departments; although a rain storm prevailed all of the first and a part of second day of the fair, yet we had a fine show of cattle, horses, sheep and swine, likewise of poultry; of vegetables, grain, &c., &c.; the hall made a fine display in the several departments; also a fair representation in the mechanical division, and not the least attractive was the superior display in the ladies' department, both for utility and fancy.

The receipts for the current year were	$830 98
Expenditures	742 07
Balance	$88 91

Officers, 1863: Uriah Hair, President; V. T. Browvere, Secretary; D. Disbrow, Treasurer.

DANIEL SUPPLEE, *Treasurer.*

DUNDEE, *January* 10, 1863.

MANLIUS AND POMPEY.

The Manlius and Pompey Agricultural and Mechanical Association report that, for the year since the last report, there has been raised and received by the society the sum of $239.72; there has been paid out $197.84, leaving a balance on hand of $41.88, at the date of treasurer's report, December 27, 1862.

The fourth annual fair was held on the fair grounds in Manlius village, on September 25th and 26th, 1862. The number of entries was considerably less than at the fair of the previous year, owing, as it is believed, to the attention of the community being so much turned to war matters. Indeed, it was at one time a matter of serious consideration whether any fair should be held. The exhibition of sheep, principally Spanish Merino, was a very good one—a good deal of attention being paid to sheep husbandry within the limits of the association. No money premiums were paid. A small entrance fee for carriages was required at the gate. The attendance on the fair grounds was large, being nearly, if not quite, equal to that of previous years. A very interesting farmers' talk was held on the evening of the first day of the fair, at which Hon. Henry S. Randall was present. The chief topic of the evening was the sheep, Mr. Randall giving in conversational style the results of some of his recent investigations into the history of the importation of sheep into this country. Some discussion

was had on the diseases of lambs. Several present had lost lambs affected with swelled neck; others from a species of rigidity.

On the second day of the fair the annual address was delivered by Hon. Henry S. Randall. He sketched the progress of improvements in agriculture, the impediments that stand in the way of progress, with illustrations of various forms of quackery in agricultural matters, and the direction in which further progress may be expected.

About the middle of January of the present year, the president of this association met the presidents of other town societies at Syracuse, for the purpose of making arrangements for taking the agricultural statistics, authorized by the last Legislature. In addition to Manlius and Pompey, this society undertook the collection of statistics in De Witt and Syracuse. As soon as the blanks were received they were promptly distributed, and are now, most of them it is believed, filled up.

The officers of the society for 1863, elected at the annual meeting held on Tuesday, January 20: Edmund O. Clapp, President, Manlius; Wm. Manlius Smith, Secretary, Manlius; J. C. Losey, Assistant Secretary, Manlius; Daniel Losey, Treasurer, Manlius.

E. O. CLAPP, *President.*

Union Agricultural Society, Palmyra.

The seventh annual fair and cattle show of this society was held upon its grounds in Palmyra village, on the 6th, 7th and 8th days of October, 1862.

In most of the departments of the exhibition the show was good, and especially so in respect to cattle, horses and stock generally. The representation of fruits was also very satisfactory, well sustaining the previous reputation of this agricultural region on that head.

The attendance of people was large, and mutual cordiality marked the entire intercourse between them and the officers of the society on the occasion. Ornon Archer, Esq., deliverd the annual address.

The receipts of the fair were	$666 94
Expenses, including premiums	565 60
Balance in treasury	$101 34

The plan of free entrance for all stock and articles offered on exhibition, retaining to the society 40 per cent. of the premiums awarded, has been adopted for the two last fairs, and proved decidedly advantageous, both in respect to the increased competition and in the enlarged receipts of the treasury. It appears to give entire satisfaction to all concerned.

Officers of the society were elected for the present year at an adjourned annual meeting on the 21st of February, viz: President, Henry J. Foster; Cor. Secretary, Pomeroy Tucker; Recording Secretary, Charles A. Allyn; Treasurer, George W. Cuyler.

The society has introduced the system of agricultural discussions, in which members and others present at its meetings participate. Theories, experiences and opinions, in the various departments of farming industry, are familiarly compared and discussed, and much practical knowledge and useful suggestion thus imparted and exchanged.

The fair grounds, embracing twenty acres of land, well inclosed by substantial close fence, with a superior circular trial track for horses, and a commodious floral hall and other buildings, costing in all about $6,000 (heretofore held on lease at an annual rent), have been purchased by the society, at the price of $150 per acre—a mortgage given for the purchase money, payable in eight years. To meet the annual interest and extinguish the principal of the debt by the expiration of the mortgage, a sinking fund has been inaugurated, to which an annual appropriation is pledged from the receipts of exhibitions, together with such other contributions as may from time to time be acquired from various sources.

P. TUCKER, *Cor. Sec.*

Orwell, Boylston and Richland.

In furnishing you with our fifth annual report, it affords us much pleasure to be able to say that our fair, which was held September 11th and 12th, was a complete success, the attendance being a fair average with former years—every department well represented.

Total receipts of the fair	$397 80
Balance on hand from former years	22 37
	$420 17
Amount of disbursements for premiums, &c	302 22
Balance in the hands of the treasurer	$117 95

The unfavorable season for agricultural purposes through which we were passing, and the general gloom and despondency pervading all classes of community at this time, caused by the great effort that had just been made to furnish our quota of the 600,000 men called for by President Lincoln, and the terrible disaster to our arms in Virginia, but a few days previous, in which engagements many of the brave volunteers from this immediate vicinity had fallen, all tended no doubt to greatly diminish the receipts of the fair. Still, under all these discouraging circumstances, they were amply sufficient to pay all expenses, premiums, &c.

E. H SARGENT, *Secretary.*

Seneca Falls Union Agricultural Society.

In behalf of the Seneca Falls Union Agricultural Society I send you the following report.

The annual fair was held on the 23d, 24th and 25th of September. It was well attended, and the receipts exceeded the expenditures. The show of stock, agricultural and mechanical products was quite large, and competition very close.

Although the society has an organization of only three years, yet during that time it has met with almost unprecedented success. The society has a permanent lot located in the village of Seneca Falls, containing fifteen acres, inclosed with a substantial fence eight feet high, and one of the best half mile tracks in the State.

Officers for the ensuing year: President, G. W. Randall; Vice-President, Deming Boardman; Treasurer, John Cuddeback; Secretary, Geo. Pontius.

GEORGE PONTIUS, *Secretary.*

Van Buren and Lysander.

Three years ago a few farmers of the towns of Van Buren and Lysander, in Onondaga county, organized a farmers' club, for the purpose of improvement in agriculture and horticulture, by holding discussions.

The past year the club was reorganized under the name of the Van Buren and Lysander Farmers' Club, in conformity with the statutes, that we might be legally recognized, and for the purpose of holding fairs. It was decided to hold a fair sometime the last autumn, but before much preparation had been made, the call for 600,000 more soldiers was issued by the President. The members of our club feeling the necessity of giving their energies to the support of the government, and the loss of laborers by enlistment into the army, induced us to forego the pleasures and the profits of a fair for this time.

We met occasionally, as heretofore, for discussions, and are profited by them. Discussions, on even familiar subjects, bring out new ideas, clear away the cobwebs of prejudice and old habits, and open the way to improvement.

The officers for the year are: President, Rufus Sears; Vice-Presidents, Joel S. Crane, E. L. Talmadge; Recording Secretary, N. M. White; Corresponding Secretary, W. Tappan; Treasurer, A. Cunningham; Directors for one year, S. Bisder, H. Daboll; for two years, A. W. Bingham, H. Brown; for three years, B. C. Upson, A. H. Toll.

N. M. WHITE, *Recording Secretary.*

Baldwinsville, *January 20th*, 1863.

Vienna, Oneida County.

The following report of the Vienna Town Agricultural Society is respectfully submitted for the benefit of the State Society.

The receipts for the past year were $230.34; the amount paid was $110; the expenses, other than premiums, $95; balance on hand, $24.95.

The monthly meetings for discussion and lectures have been well kept up. The fair was held September 17th and 18th, and was well attended, and was a complete success. The lack of show in stock was the only drawback.

The address was delivered by Hon. C. M. Scholefield, of Whitestown, and was well received by the society.

The officers for the ensuing year are: President, Robert Lauson; Secretary, Charles Graham; Treasurer, L. L. Stedman.

A. W. KELLOGG, *late Secretary.*

North Bay, *January 10th*, 1863.

Winfield Union Agricultural Society.

The Winfield Union Agricultural Society held its sixth annual fair on the grounds formerly occupied and fitted up for that purpose, on the 7th and 8th days of October, 1862. Considering the distracted state of the country at this time, and the many interests to be attended to in consequence of the present rebellion, it was a fine show. Being postponed from October 1st and 2d, on account of a heavy rain, much interest was lost in

the show, but, considering all things, the display of articles was very creditable to the society. The whole number of entries was 706. Number of members, present year, 271.

The following list contains the entries for the present year:

Horses, 121; cattle, 99; sheep, 32; swine, 12; fowls, 19; cheese, 15; grain, 49; butter, 8; fruit, 30; roots, etc., 114; painting and drawing, 32; needlework, 18; worsted and silk work, 27; mechanical implements, 24; domestic and woolen manufactures, 55; culinary, 29; fancy work, 18; millinery and floral work, 4.

Jan. 8, 1862.	Balance cash in hands of the treasurer	$222 23
	Interest on above	11 65
	Amount received by treasurer this year	526 28
		$760 16
	Paid premiums on awards, October 8, 1862	$256 77
	Paid expenses present year	257 01
	Balance in hands of treasurer	246 38
		$760 16

Received from State Society, thirty books, and have awarded twenty-six volumes as premiums.

Officers, 1863: Isaac L. Moore, President; Russell Huntley, Secretary; Hiram Brown, Treasurer.

ISAAC L. MOORE, *President.*

TREASURER'S REPORT.

LUTHER H. TUCKER, *Treasurer, in account with the New York State Agricultural Society*, 1862.

RECEIPTS.

Cash on hand per last account		$142 69
Memberships at annual meeting		37 00
Life memberships, during the year		250 00
Annual membership, during the year		1 00
Donation from Hon. Zadock Pratt		50 00
Volumes Transactions sold		18 00
Avails of note discounted, May 10		728 58
do do do do 24		730 30
State appropriation, Dr. Fitch, State Entomologist		1,000 00
do do for State Agricultural Society		840 00
do do flax machinery premiums		2,000 00
Receipts at Rochester fair:		
Entries, tickets sold, etc	$10,817 45	
Rent of grounds	375 00	
Life memberships	79 00	
		11,271 45
Hon. E. Cornell, services Arabian horse, 1863		100 00
		$17,169 02

DISBURSEMENTS.

For premiums at winter meeting	$219 73
For premiums, etc., due on account of previous years	534 68
Library and museum expenses	82 75
Salary of Dr. Fitch, State entomologist	1,000 00
Salaries and traveling expenses	2,823 88
Incidental expenses	101 17
Postage account	126 95
Loan account	1,500 00
Printing and stationery	386 13
Premiums and premium expenses of Rochester fair	4,486 77
Expenses of Rochester fair	2,092 90
	$13,354 96
Cash on hand, including the still unexpended State appropriation of $2,000 for premiums on flax machinery	3,814 06
	$17,169 02

We hereby certify that we have examined the account here presented, compared it with the accompanying vouchers, and that we find the same correct and in all respects just and true.

A. HUBBELL,
WILLIAM NEWCOMB,
Auditing Committee.

E. CORNELL, *President.*
B. P. JOHNSON, *Secretary.*

ALBANY, *February* 11, 1863.

AWARD OF PREMIUMS.

TWENTY-SECOND ANNUAL FAIR, HELD AT ROCHESTER, SEPTEMBER 30TH, AND OCTOBER 1ST, 2D AND 3D, 1862.

CLASS I.—CATTLE

No. 1. SHORT HORNS—BULLS.

Three years old and upwards:

1st premium, George Miller, Markham, C. W. ..... Dip. and $20
2d do Wm. Jackson, Fayette, Seneca county 15
3d do G. C. Fellows, Marcellus 5

Two years old:

1st premium, James O. Sheldon, Geneva 20
2d do T. L. Harrison, Morley 10
3d do James S. McCall, Lyons 5

One year old:

1st premium, George Phillips, Ogdensburgh 15
2d do Maxon & Heustis, Adams 10
3d do Michael B. Ritter, Varick, Seneca county 5

Bull calf:

1st premium, James O. Sheldon, Geneva 5
2d do Elihu Griffen, Clinton Corners, Dutchess county ..... Trans.
3d do James O. Sheldon, Geneva ..... Trans.

Sweepstakes.

James O. Sheldon, Geneva, Short Horn bull, two years old ..... S. Medal.

No. 2. SHORT HORNS—COWS.

Three years old and upwards:

1st premium, Elihu Griffen, Clinton Corners, "Bertha" ..... Dip. and $20
2d do A. Stevens, Batavia 15
3d do George Phillips, Ogdensburgh 5

Heifer, two years old:

1st premium, A. B. Conger, Haverstraw, "Artless" 20
2d do A. Stevens, Batavia 10
3d do C. K. Ward, LeRoy 5

Heifer, one year old:

1st premium, Elihu Griffen, Clinton Corners, "Emma" 15
2d do George Phillips, Ogdensburgh 10
3d do C. K. Ward, LeRoy 5

Heifer calf:

1st premium, A. Stevens, Batavia 5
2d do C. K. Ward, LeRoy ..... Trans.
3d do George Phillips, Ogdensburgh ..... Trans.

Sweepstakes.

Elihu Griffen, Clinton Corners, Short Horn cow, "Bertha," three years old ..... S. Medal.

No. 3. DEVONS—BULLS.

Bull, two years old:
1st premium, A. B. Conger, Haverstraw, "2d Frank Quartley"..... $20
2d do Wm. Simpson, Jr., New Hudson, "Allegany"..... 10
Bull, one year old:
1st premium, Joseph Hilton, New Scotland, "Empire 5th"..... 15
Bull calf:
1st premium, A. Stevens, Batavia, "Duke of York"..... 5
2d do Wm. Simpson, Jr., New Hudson, "Westchester"....Trans.

Sweepstakes.

A. B. Conger, Haverstraw, "2d Frank Quartley".....S. Medal.

No. 4. DEVONS—COWS.

Three years old and upwards:
1st premium, Joseph Hilton, New Scotland, "Belle".....Diploma and $20
2d do A. Stevens, Batavia, "Lovely 4th"..... 15
3d do A. Stevens, Batavia, "Lovely 11th"..... 5
Heifer, two years old:
1st premium, Joseph Hilton, New Scotland, "Nonpareil"..... 20
2d do A. Stevens, Batavia, "Lovely 15th"..... 10
3d do do do "Lovely 13th"..... 5
Heifer, one year old:
1st premium, Joseph Hilton, New Scotland, "Alida"..... 15
2d do A. B. Conger, Haverstraw, "Mary 2d"..... 10
3d do Wm. Simpson, Jr., N. Hudson, "Stella"..... 5
Heifer calf:
1st premium, A. Stevens, Batavia, "Lovely 18th"..... 5
2d do A. B. Conger, Haverstraw, "Curley".....Trans.

Sweepstakes.

A. Stevens, Batavia, Devon cow, "Lovely 3d".....S. Med.

No. 5. HEREFORDS.

Bull, two years old:
1st premium, E. Corning, Jr., Albany..... $20
2d do John Hovey, Maine, Broome county..... 10
Bull, one year old:
1st premium, E. Corning, Jr., Albany..... 15
Bull calf:
1st premium, E. Corning, Jr. Albany..... 5
Cow, three years old and upwards:
1st premium, E. Corning, Jr., Albany.....Diploma and 20
2d do do do 15
3d do do do 5
Heifer, two years old:
1st premium, E. Corning, Jr., Albany..... 20
2d do do do 10
3d do do do 5
Heifer, one year old:
1st premium, E. Corning, Jr., Albany..... 15
2d do do do 10
3d do do do 5
Heifer calf:
1st premium, E. Corning, Jr., Albany..... 5

No. 6. AYRSHIRES.

Bull, three years old and upwards:
1st premium, S. D. Hungerford, Adams, "Tiger".....Diploma and 20

2d premium, John C. Dewell, Deerfield, Oneida county..... $15
3d do O. Howland, Auburn, "Governor 4th"..... 5

Bull, two years old:

1st premium, Brodie, Campbell & Co., Ellisburgh, "Horn Book"..... 20
2d do Jas. F. Converse, Woodville, Jefferson co., "Patchin".. 10

Bull, one year old:

1st premium, S. D. Hungerford, Adams, "Beecher"..... 15

Cow, three years old and upwards:

1st premium, Jas. F. Converse, Woodville, "Flora Temple"..Dip. and 20
2d do Brodie, Campbell & Co., Ellisburgh, "Lady Douglass".. 15
3d do O. Howland, Auburn, "Jenny Lind"..... 5

Heifer, two years old:

1st premium, Brodie, Campbell & Co., "H. Nell"..... 20
2d do do "Nanna"..... 10
3d do do "Highland Mary"..... 5

Heifer, one year old:

1st premium, Brodie, Campbell & Co., "Tibby"..... 15
2d do do "H. Douglass"..... 10
3d do James F. Converse, Woodville..... 5

Sweepstakes.

S. D. Hungerford, Adams, Jefferson county, Ayrshire bull "Tiger," three years old.....S. Med.
Brodie, Campbell & Co., Ellisburgh, Ayrshire cow "White Lilly," nine years old.....S. Med.

No. 7. Alderneys or Jerseys.

Bull, three years old and upwards:

1st premium, J. H. Helmer, Lockport, "Ivanhoe".....Diploma and $20

Heifer, two years old:

1st premium, James O. Sheldon, Geneva..... 20

No. 8. Grade Cattle.

Cow, three years old and upwards:

1st premium, D. H. Richardson, Henrietta.....Diploma and 20
2d do A. Tobey, Pittsford..... 15
3d do C. C. Holton, Rochester..... 5

Heifer, two years old:

1st premium, R. B. & A. A. Underhill, Clinton Corners..... 20
2d do D. H. Richardson, Henrietta..... 10
3d do D. B. De Land, Fairport, Monroe county..... 5

Heifer, one year old:

1st premium, H. Martin, Jr., West Brighton..... 15
2d do R. B. & A. A. Underhill, Clinton Corners..... 10
3d do D. L. Bailey, Henrietta..... 5

Heifer calf:

1st premium, James P. Ross, Ogden..... 5
2d do C. C. Holton, Brighton.....Trans.

Milch Cows.

1st premium, James F. Converse, Woodville.....Diploma and $15
2d do H. G. Warner, grade milch heifer, two years old, Brighton, 10

Affidavit of 1st Premium (J. F. Converse) Milch Cow.

The following is a statement of the age, breed and keeping of a cow I offer as a milch cow:

Cow 4 years old; dam, thorough-bred Ayrshire; grand-dam, thorough-bred imported Ayrshire, "Ayrshire Lass;" prize winner as a *milker* at

Watertown last year; sire, a thorough-bred Short Horn bull "Robin Hood;" great-grandsire "Robin Hood;" great-great-grand "Belted Will," imported; calved May 25th, 1862.

She gave, in June, during ten consecutive days, an average of 62 lbs. daily, on grass only.

The following is the weight of milk from August 1st to September 25th, 1862. She has been fed with green corn, shorts and grass:

	No. of lbs.		No. of lbs.
1862. August 1st	52	1862. August 31st	50
2d	54	Sept. 1st	49
3d	53	2d	50
4th	55	3d	48
5th	56	4th	49
6th	53	5th	50
7th	52	6th	51
8th	54	7th	48
9th	51	8th	50
10th	56	9th	52
11th	52	10th	51
12th	53	11th	50
13th	52	12th	48
14th	55	13th	47
15th	52	14th	48
16th	54	15th	46
17th	49	16th	48
18th	48	17th	45
19th	50	18th	44
20th	52	19th	45
21st	53	20th	44
22d	52	21st	43
23d	54	22d	42
24th	53	23d	43
25th	51	24th	42
26th	50	25th	42
27th	53		
28th	50	Total	2,835
29th	49		
30th	50		

Affidavit of the 2d Premium (H. G. Warner) Milch Cow.

STATE OF NEW YORK, }
Monroe county, } ss.

Chester Goodsell, of said county, being duly sworn, says: That he has had the sole care of the two year old heifer exhibited at this fair, under the entry in class one, number 87, for three months last past; that he has milked her during the whole time; and that she has given during that time an average of more than sixteen quarts of milk per day, weighing over three thousand pounds in the aggregate; that from the 1st of August to this date she has given eight quarts per day, weighing over 1,950 pounds; and further, that said heifer has not had, during the time above mentioned, any feed, except the ordinary pasture of grass in the field, and not any grain or meal in any shape to the knowledge or belief of deponent, and has not during the whole time been in a stable, or been sheltered, or soiled, or had any extra attention.

Sworn and subscribed this 1st day of October, 1862, &c., &c. } CHESTER GOODSELL.

Special

M. A. Abbey, Brookfield, Galloway bull and heifers..... $25

No. 9. Working Oxen, over Five Years Old.

Yoke oxen:

1st premium, Martin Roberts, Henrietta..... $15
2d do D. R. Jewett, Kendall, Orleans county..... 10

No. 10. Oxen, Four Years Old.

Single yoke:

1st premium, Elihu Griffen, Clinton Corners..... 15
2d do M. D. Beadle, Palmyra..... 10

No. 11. Steers, Three Years Old.

Single yoke:

1st premium, C. Wadsworth, Geneseo..... 10
2d do M. D. Beadle, Palmyra..... 8
3d do C. B. Eastman, Woodville.....Trans.
To boys under 16, training yoke of steers, best, Master W. F. Ross, 12 years old, Ogden, Monroe county..... Dip.

No. 12. Steers—Two Years Old.

Single yoke:

1st premium, Amos F. Wood, Woodville, Jefferson county..... $8
2d do T. V. Maxon, Adams, Jefferson county..... 6

One Year Old.

Single yoke:

1st premium, T. V. Maxon, Adams, Jefferson county..... 6
2d do C. B. Eastman, Woodville, Jefferson county..... 5

No 13. Fat Cattle—Stall Fed.

Ox, four years and upwards:

1st premium, W. G. Markham, Rush, Monroe county..... 12
2d do Enos Ganyard, Irondequoit..... 8
3d do Horace Packer, Oxford, Chenango county.....Trans.

Steer, three years old:

1st premium, James S. Wadsworth, Geneseo..... $8

Discretionary.

Wm. Smith, (Butcher,) Detroit, Michigan, for nine head very superior fattened animals.....Diploma

No. 14. Fat Cattle—On Hay and Grass.

Ox, four years and upwards:

1st premium, J. P. Ross, Ogden..... $10
2d do J. H. Sutherland, Pittsford..... 6
3d do A. B. Benham, Dryden.....Trans.

Cow, four years and upwards:

1st premium, A. Stevens, Batavia..... $10
2d do do do 6

Steer, three years old:

1st premium, P. V. Schaack, Brighton..... 8
2d do C. Wadsworth, Geneseo..... 3
3d do A. Stevens, Batavia.....Trans

Heifer, three years old:

1st premium, A. Stevens, Batavia..... $8

Class II.—Horses.

No. 15. For all work—Stallions.

Stallion, four years and upwards:

1st premium, M. Bailey, Hamlin, Monroe co., "Mountaineer".Dip. and 20

2d premium, George Benedict, Verona, "Pathfinder,"..... $15
3d do Francis Bortle, Perrinton, "D'Conde" .....Youatt.

No. 16. Brood Mares and Foals.

Brood Mare, with foal at her foot, 4 years and upwards:
1st premium, W. H. Crane, Benton Centre, Yates co.....Diploma and $20
2d do Wm. Middlebrook, Canandaigua..... 15
3d do F. Fellows, Clifton, Monroe county .....Youatt.

No. 17. Horses of Morgan or Black Hawk Breed.

Stallion, 4 years and upwards:
1st premium, Wm. S. Parker, New Hope, Cayuga county, "Black Hawk Turk".....Diploma and $20
2d do G. H. Cole, Rutland, Vt., "Rutland Morgan"..... 15
3d do R. J. Hunn, Pine Hill, "Way Boy," .....Youatt.

Special.

The Committee would make special mention of Mr. J. O. Hall's Rochester Horse "Star of the West." Not being strictly Vermont Black Hawk, but of the New York stock, they could not give him the premium.

GEORGE P. DUNCAN,
ISAAC H. COCKS.

No. 18. Draught.

Stallion, four years and upwards:
1st premium, E. Seeley, Williamson.....Diploma and $20
2d do Edwin Griffen, Riga, "Geo. Buchanan,"..... 15
3d do John Irvine, Jordan, Onondaga county.....Youatt.
Pair of Matched Draught or Farm Horses:
1st premium, George W. Couch, Rochester..... $15
2d do Ellwanger & Barry, Rochester..... 10

No. 19. Thorough-Bred.

Stallion, four years and upwards:
1st premium, W. H. Crane, Benton Centre, Yates co.,....Diploma and 20
1st premium, stallion, three years old, Henry T. Case, Canandaigua, Diploma and 15
1st premium, mare, three years old, A. B. Conger, Haverstraw, "Young May".....Diploma and 15

No. 20. Three Years Old.

Stallion, three years old:
1st premium, George W. Miller, Conquest, Cayuga county, "Reindeer,".....Diploma and 15
2d do L. D. Gage, Gorham, Ontario county, "Consternation,".. 10
3d do Wm. H. Pendry, Albion.....Dadd.
Mare, three years old:
2d premium, Wm. Middlebrook, Canandaigua..... $10

No. 21. Two Years Old.

Stallion, two years old:
1st premium, Joseph Stottle, Chili..... 15
2d do G. W. Tracey, Medina, "Membrino"..... 10
3d do John Snell, Edmondton, C. W.....Dadd.
4th do J. K. Ballentine, honorable mention.
Mare, two years old:
2d premium, Levi Benedict, Mendon, "Belle of Mendon"..... $10
3d do Robert Bell, West Brighton.....Dadd.

No. 22. One Year Old—Colts.

Stallion, one year old:
2d premium, D. P. Newell, Parma Centre $5
Mare, one year old:
2d premium, H. W. Little, Henrietta..... 5

No. 23. Matched Horses—*Not under 16 hands, for road or carriage.*

1st premium, John D. Gillett, Henderson..... 15
2d do Ellwanger & Barry, Rochester 10

No. 24. Matched Horses—*For road or carriage.*

Matched horses, 14 to 16 hands:
1st premium, J. W. Briggs, Macedon, Wayne county..... 15
2d do M. F. Reynolds, Rochester..... 10

Discretionary.

E. M. Allbright, Olcott, Niagara county, pair matched horses, highly commended.
A. H. Plato, Batavia, pair matched horses, highly commended.

No. 25. Trained Saddle Horse.

1st premium, H. C. Case, Rome..... 10
2d do John D. Gillett, Henderson, Jefferson county..... 8

No. 26. Geldings.

Gelding:
1st premium, Henry T. Carr, Canandaigua..... 10
2d do A. Stewart, Albion, Orleans county..... 8

No. 27. Single Mares.

1st premium, A. O. Snell, Athens, Penn..... 10
2d do S. M. Beach, Wright's Corners, Niagara county..... 8

No. 28. Three Years Old Geldings and Mares.

1st premium, Marcus Rice, Watertown..... 6
2d do T. F. Little, Chili, Monroe county..... 4
Mare, three years old:
1st premium, R. P. Hubbard, Chili, Monroe county..... 6
2d do R. P. Hubbard, Chili do 4

No. 29. Single Trotting Horse, Mare or Gelding, in Harness.

1st premium, Thomas Brown, St. Catharines, C. W..... 10
2d do S. G. Fay, Bath, Steuben county..... 8

No. 30. Jacks and Mules.

Jack:
1st premium, C. H. Walker, Pearl Creek, Wyoming county..... 15
Five mule colts:
1st premium, C. H. Walker, Pearl Creek, Wyoming county. 10
Single mule colt:
1st premium, C. H. Walker, Pearl Creek, Wyoming county..... 5

Class III.—Sheep.

No. 31. Fat Sheep.

Long wooled, two years and upwards:
1st premium, Wm. Smith, Detroit, Michigan..... 5
2d do do do do 3
3d do do do do .....Morrell's Shep.

Long wooled, under two years:
1st premium, John Snell, Edmondton, C. W..... $5
2d do Amos F. Wood, Woodville..... 3
3d do C. B. Eastman, Woodville.....Morrell's Shep.
Middle wooled, two years and upwards:
1st premium, Elihu Griffen, Clinton Corners..... $5
2d do R. H. Avery, Wampsville, Madison county..... 3
3d do Elihu Griffen, Clinton Corners.....Morrell's Shep.
Middle wooled, under two years:
1st premium, R. H. Avery, Wampsville, Madison county..... $5
2d do do do do..... 3
Cross breed, two years and upwards:
1st premium, C. B. Eastman, Woodville..... 5
2d do L. L. Murdock, Medina..... 3
3d do do do.....Morrell's Shep.
Cross breed, under two years:
1st premium, C. B. Eastman, Woodville..... $5
2d do Amos F. Wood, Woodville..... 3
3d do T. W. Murdock, Medina.....Morrell's Shep.

No. 32. Long Wooled, Leicester.

Buck, two years and upwards:
1st premium, George Miller, Markham, C. W..... $10
2d do John Snell, Edmondton, C. W..... 8
3d do James Lawrie, Malvern, C. W..... 5
Buck, under two years:
1st premium, John Snell, Edmondton, C. W..... 10
2d do Brodie, Campbell & Co., New York Mills, Oneida Co.... 8
3d do George Miller, Markham, C. W..... 5
Pen five ewes, two years and upwards:
1st premium, Amos F. Wood, Woodville..... 10
Pen five ewes, under two years:
1st premium, Brodie, Campbell & Co., New York Mills..... 10
2d do C. B. Eastman, Woodville..... 8
Pen three buck lambs:
1st premium, Brodie, Campbell & Co., New York Mills..... 5
Pen three ewe lambs:
1st premium, Brodie, Campbell & Co., New York Mills..... 5

No. 33. Long Wooled, not Leicester.

Buck, two years and upwards:
1st premium, John Snell, Edmondton, C. W..... 10
2d do George Miller, Markham, C. W..... 8
3d do E. Gazeley, Clinton Corners..... 5
Buck, under two years:
1st premium, John Snell, Edmondton, C. W..... 10
2d do do do do..... 8
3d do James F. Converse, Woodville, Jefferson county..... 5
Pen five ewes, two years and upwards:
1st premium, John Snell, Edmondton, C. W..... 10
2d do E. Gazeley, Clinton Corners..... 8
3d do Cooper Sayre, Oaks Corners..... 5
Pen five ewes, under two years:
1st premium, E. Gazeley, Clinton Corners..... 10
2d do James F. Converse, Woodville..... 8
3d do Cooper Sayre, Oaks Corners..... 5
Pen three buck lambs:
1st premium, James F. Converse, Woodville..... 5

Pen three ewe lambs:
1st premium, E. Gazeley, Clinton Corners $5
2d do Cooper Sayre, Oaks Corners.....Morrell's Shep.

No. 34. Middle Wooled, South Downs.

Buck, two years and upwards:
1st premium, Samuel Thorne, Thornedale $10
2d do Peter Lorrillard, West Farms 8
Pen five ewes, two years and upwards:
1st premium, Elihu Griffen, Clinton Corners 10
2d do do do 8
3d do R. H. Avery, Wampville..... 5
Buck, under two years:
1st premium, Samuel Thorne, Thornedale..... 10
2d do Peter Lorrillard, West Farms 5
Pen five ewes, under two years:
1st premium, James O. Sheldon, Geneva..... 10
2d do Elihu Griffen, Clinton Corners 8
Pen three buck lambs:
1st premium, E. G. Cook, Ellisburgh 5
2d do R. H. Avery, Wampsville.....Morrell's Shep.
Pen three ewe lambs:
1st premium, Elihu Griffen, Clinton Corners..... $5
2d do R. H. Avery, Wampsville .....Morrell's Shep.

No. 35. Middle Wooled, not South Downs.

Buck, two years and upwards:
1st premium, Jacob Lorrillard, New York $10
2d do George Miller, Markham, C. W..... 8
Buck, under two years:
1st premium, Jacob Lorrillard, New York 10
2d do do do 8
Pen five ewes, under two years:
1st premium, C. B. Meek, Canandaigua..... 10
2d do A. T. Parsons, North Chili, Monroe county... 8
Pen three buck lambs:
1st premium, George Miller, Markham, C. W..... 5
2d do C. B. Meek, Canandaigua .....Morrell's Shep.
Pen, three ewe lambs:
1st premium, C. B. Meek, Canandaigua..... $5
2d do A. T. Parsons, North Chili.....Morrell's Shep.

Discretionary.

Hampshire Down buck, two years old, A. T. Parsons, North Chili.... $10
Hampshire Down buck, two years old, C. B. Meek, Canandaigua..... 5

No. 36. Spanish Merinos.

Buck, two years and upwards:
1st premium, George Campbell, Westminster, Vt..... 10
2d do George Brown, Oaks Corners..... 8
3d do Rosier & Hillman, East Avon..... 5
Buck, under two years:
1st premium, George Campbell, Westminster, Vt..... 10
2d do Rosier & Hillman, East Avon..... 8
3d do Pitts & Wiley, Honeoye, Ontario county..... 5
Pen five ewes, two years and upwards:
1st premium, George Campbell, Westminster, Vt..... 10
2d do Pitts & Wiley, Honeoye..... 8

3d premium, John Pierce, Spencerport..... $5

Pen five ewes, under two years:

1st premium, George Campbell, Westminster, Vt..... 10
2d do Pitts & Wiley, Honeoye..... 8
3d do John Pierce, Spencerport..... 5

Pen three buck lambs:

1st premium, George Campbell, Westminster, Vt..... 5
2d do Pitts & Wiley, Honeoye.....Morrell's Shep.

Pen three ewe lambs:

1st premium, Pitts & Wiley, Honeoye..... $5
2d do do do .....Morrell's Shep.

Twenty fleeces fine wool:

1st premium, George Brown, Phelps..... $15
2d do do do 10

No. 37. Silesian Merinos.

Buck, two years and upwards:

1st premium, Wm. Chamberlain, Red Hook..... 10
2d do Carl Heyne, Red Hook..... 8
3d do George Brown, Oaks Corners..... 5

Buck, under two years:

1st premium, William Chamberlain, Red Hook..... 10

Pen five ewes, two years and upwards:

1st premium, Wm. Chamberlain, Red Hook..... 10
2d do Carl Heyne, Red Hook..... 8

Pen five ewes, under two years:

1st premium, William Chamberlain, Red Hook..... 10
2d do Carl Heyne, Red Hook..... 8

Pen three buck lambs:

1st premium, William Chamberlain, Red Hook,..... 5

Pen three ewe lambs:

1st premium, William Chamberlain, Red Hook..... 5

No. 38. Cross Breed of Fine Wool—Saxons and Merinos.

Buck, two years and upwards:

1st premium, W. L. Chamberlain, Rhinebeck..... 10
2d do S. S. Rice, Clarkson, Monroe county..... 8
3d do do do do 5

Buck, under two years:

1st premium, W. L. Chamberlain, Rhinebeck..... 10

Pen five ewes, two years and upwards:

1st premium, W. L. Chamberlain, Rhinebeck..... 10
2d do George Brown, Oaks Corners..... 8
3d do S. S. Rice, Clarkson..... 5

Pen five ewes, under two years:

1st premium, W. L. Chamberlain, Rhinebeck..... 10

Pen three buck lambs:

1st premium, W. L. Chamberlain, Rhinebeck..... 5
2d do E. G. Cook, Ellisburgh.....Morrell's Shep.

Pen three ewe lambs:

1st premium, W. L. Chamberlain, Rhinebeck..... $5
2d do George Brown, Oaks Corners.....Morrell's Shep.

No. 39. Cross Breed of Coarse or Middle Wool.

Buck, two years and upwards:

1st premium, George Betteridge, Riga, Monroe county..... $10
2d do L. L. Murdock, Medina..... 8
3d do T. W. Murdock, Medina..... 5

Buck, under two years:
1st premium, L. L. Murdock, Medina..... $10
2d do T. W. Murdock, Medina..... 8
Pen five ewes, two years and upwards:
1st premium, L. L. Murdock, Medina..... 10
2d do Amos F. Wood, Woodville..... 8
3d do George Betteridge, Riga..... 5
Pen five ewes, under two years:
1st premium, L. L. Murdock, Medina..... 10
2d do C. B. Eastman, Woodville..... 8
3d do George Betteridge, Riga..... 5
Pen three ewe lambs:
1st premium, Amos F. Wood, Woodville..... 5
2d do T. W. Murdock, Medina.....Morrell's Shep.
Best shepherd's dog, E. N. Bissell, Shoreham, Vt..... $5

No. 40. SWINE.—*Large Breed.*

Boar, two years old and upwards:
1st premium, T. T. Cavanagh, Watertown..... 10
2d do James F. Converse, Woodville..... 5
Boar, one year old:
1st premium, Robert Bell, West Brighton..... 10
2d do A. B. Benham, Dryden..... 5
Boar, six months and under one year:
1st premium, A. C. Clark, Henderson..... 8
Breeding sow, two years old and upwards:
1st premium, T. T. Cavanagh, Watertown..... 10
2d do James F. Converse, Woodville..... 5
Sow, six months and under one year:
1st premium, T. T. Cavanagh, Watertown..... 8
2d do James F. Converse, Woodville..... 4
Lot of pigs, not less than five, under ten months:
1st premium, James F. Converse, Woodville..... 8
2d do T. T. Cavanagh, Watertown..... 4

Small Breed.

Boar, two years old and upwards:
1st premium, R. B. and A. A. Underhill, Clinton Corners..... 10
2d do A. B. Benham, Dryden..... 5
Boar, one year old:
2d premium, E. S. Hayward, Rochester..... 5
Boar, six months and under one year:
2d premium, E. S. Hayward, Rochester..... 4
Breeding sow, two years old and upwards:
1st premium, E. S. Hayward, Rochester..... 10
Breeding sow, one year old:
1st premium, A. C. Clark, Henderson..... 10
2d do Joseph Kurtz, Pittsford..... 5
Sow, six months and under one year:
1st premium, E. S. Hayward..... 8
Lot of pigs, not less than five, under 10 months:
1st premium, Joseph Kurtz, Pittsford..... 8

No. 41. POULTRY—DOMESTIC AND FROM OTHER STATES.

Lot of White Dorkings (1 cock and 2 hens):
1st premium, Heffron & Barnes, Utica..... 3

2d premium, Heffron & Barnes, Utica..... $2

Gray or Speckled Dorkings:

1st premium, Heffron & Barnes, Utica..... 3
2d do J. R. Page, Sennett..... 2

Lot Black Spanish:

1st premium, Heffron & Barnes, Utica..... 3
2d do John Spath, Geddes, Onondaga county..... 2

Lot White Polands:

1st premium, E. A. Wendell, Albany..... 3
2d do do do 2

Lot Black Polands:

1st premium, John Spath, Geddes..... 3
2d do E. A. Wendell, Albany..... 2

Lot Golden Polands:

1st premium, John Spath, Geddes..... 3
2d do E. A. Wendell, Albany..... 2

Lot Silver Polands:

1st premium, John Spath, Geddes..... 3
2d do E. N. Bissell, Shoreham, Vt..... 2

Lot Bolton Grays:

1st premium, E. N. Bissell, Shoreham, Vt..... 3
2d do E. A. Wendell, Albany..... 2

Lot Game:

1st premium, E. N. Bissell, Shoreham, Vt..... 3
2d do E. A. Wendell, Albany..... 2

Lot of Shanghai:

1st premium, Heffron & Barnes, Utica..... 3
2d do E. N. Bissell, Shoreham, Vt..... 2

Lot Gold Lace Bantams:

1st premium, E. A. Wendell, Albany..... 3
2d do do do 2

Lot Silver Lace Bantams:

1st premium, E. N. Bissell, Shoreham, Vt..... 3

Lot of any other variety:

1st premium, (Black Bantams,) Wm. King, Rochester..... 3
2d do (Java Bantams,) Heffron & Barnes, Utica..... 2

Native or Dunghill Fowls:

1st premium, Heffron & Barnes, Utica..... 3
2d do E. N. Bissell, Shoreham, Vt..... 2

Turkeys.

Pair Turkeys:

1st premium, J. R. Page, Sennett..... 3
2d do Heffron & Barnes, Utica..... 2

Pair Wild Turkeys:

2d premium, O. Howland, Auburn..... 2

Ducks.

Pair Muscovy:

1st premium, O. Howland, Auburn..... 3
2d do E. A. Wendell, Albany..... 2

Pair Aylesbury:

1st premium, Lewis F. Allen, Buffalo..... 3
2d do E. N. Bissell, Shoreham, Vt..... 2

Pair Black Cayugas:

1st premium, Lewis F. Allen, Buffalo..... 3
2d do J. R. Page, Sennett..... 2

Pair Topknots:
1st premium, Heffron & Barnes, Utica $3
2d do E. A. Wendell, Albany 2
Pair Common:
1st premium, Amos F. Wood, Woodville 3
2d do E. N. Bissell, Shoreham, Vt 2

Geese.

Pair Common:
1st premium, Heffron & Barnes, Utica 3
2d do E. A. Wendell, Albany 2
Pair Bremen:
1st premium, Heffron & Barnes, Utica 3
2d do O. Howland, Auburn 2
Pair White China:
1st premium, Lewis F. Allen, Buffalo 3
2d do Heffron & Barnes, Utica 2
Pair Brown China:
1st premium, Lewis F. Allen, Buffalo 3
2d do E. A. Wendell, Albany 2
Pair African:
1st premium, Heffron & Barnes, Utica 3
2d do E. A. Wendell, Albany 2
Pair Wild:
1st premium, John Spath, Geddes 3
2d do E. N. Bissell, Shoreham, Vt 2

Guinea Fowls.

Lot:
1st premium, Heffron & Barnes, Utica 3

Pea Fowls.

Lot:
1st premium, Heffron & Barnes, Utica 3

Pigeons.

Greatest variety:
1st premium, Heffron & Barnes, Utica 3
2d do E. N. Bissell, Shoreham, Vt 2

Best Exhibition of Poultry, owned by Exhibitor.

Lot:
1st premium, Heffron & Barnes, Utica 5
2d do E. A. Wendell, Albany 3

Discretionary.

The committee recommended a discretionary premium to Heffron & Barnes, Utica, for fine display of Derby and other game fowls . . S. Medal.
Also to G. Westfall, West Brighton, for fine show of Sumatra game . . . . Dip.

Rabbits.

Pair Long-Eared:
1st premium, Wm. Appleton, Jr., Albany $3
2d do do do 2
Pair Common:
1st premium, Heffron & Barnes, Utica 3
2d do Wm. Appleton, Jr., Albany 1

Discretionary.

Rouen Ducks, Lewis F. Allen, Buffalo ..... Dip.
do E. N. Bissell, Shoreham, Vt ..... Dip.
Black Hamburg Ducks, John Spath, Geddes ..... Favorable notice.

CLASS IV.—FARM IMPLEMENTS AND MACHINERY

No. 42. PLOWING MATCH.

1st premium, George Betteridge, Riga, Monroe county $20
2d do D. De Garmo, Rochester..... 15
3d do Thomas Brodie, Riga 10
4th do William Langmead, Riga.....Trans.

Boys under twenty-one years of age.

John Miller, Henrietta $10

Discretionary.

Wm. Sanderson, Penn Yan, D. B. Westfall, Lyons, Joel Clarke, La Grange, L. L. French, Richfield Springs, volume Transactions to each.

No. 43. FARM IMPLEMENTS FOR WORKING THE GROUND AND PUTTING IN CROPS.

1st premium, plow, with newly invented principles, D. De Garmo, Rochester .....S. M.
1st do cast steel plow, Remington, Markham & Co., Ilion.....S. M.
1st do collection plows, Whiteside, Barnett & Co., Brockport... Dip.
1st do harrow, Lyman Cook, Rochester $5
2d do T. C. Hooker, Kendall, Orleans county..... 3
1st do two horse cultivator, J. Fink, Baldwinsville..... 5
1st do one horse cultivator, Thomas Brown, Conquest, Cayuga Co. 5
1st do Buckeye grain drill, with apparatus for distributing grain and seeds, Wm. Mast & Co., Springfield, Ohio.....S. M.
1st do horse hoe for cleaning drilled crops, M. Alden, Auburn:. $8
1st do potato digger, H. S. Chichester, Troy 3
2d do J. Fink, Baldwinsville..... 2
1st do farm wagon, James Lawrie, Malvern, C. W..... 5
2d do Joseph Williams, West Henrietta..... 3
1st do ox yoke, M. W. Mason, Elbridge..... 2

Discretionary.

Ditching plow, A. J. Bartlett, Kendaia.....Dip.
Portable fence, R. M. Daniels, Rochester.....Dip.
Board and wire fence, Ira J. Almy, Seneca county.....Dip.
Swingbeam plow, D. C. Alling, Rochester.....Trans.
Combined plow, T. W. Rappelyea .....Dip.
Self-holding furrow gauge plow, C. R. Brinkerhoff, Batavia .....Dip.
Wheel plow, W. D. Burrill, Geneva.....Dip.
Universal plow, iron beam, J. Nourse & Co., Boston.....Dip.
Seed cultivator teeth, Remington, Markham & Co, Ilion.....Dip.
Fisher's patent lever plow, J. Ellison, New York.....Dip.
Fisher's patent lever corn plow, J. R. Mount, New York. .....Dip.
Iron frame gang plow, Whiteside, Barnett & Co., Brockport.....Trans.
Bean planter, Whiteside, Barnett & Co.....Dip.
Plowing machine, H. H. Barker, New York.....Trans.
Three horse whiffletree, A. M. Beebe, West Bloomfield .....Trans.
Seeding machine, Ira Standrough, Newark .....Trans.
Corn sheller, Samuel Richardson, Rochester.....Dip.
Combined potato digger and cultivator, Joseph Slocum, Syracuse ....Dip.
Yankee farm planter, cultivator and root digger, S. W. Hall, Elmira..Dip.

No. 44. MACHINES AND IMPLEMENTS FOR GATHERING, THRASHING AND CLEANING CROPS.

1st premium, horse power, lever principle, Dow & Fowler, Fowlersville, $8
2d do C. & L. Perigo, Groton, Tompkins county..... 4
1st do endless railway, R. & M. Harder, Cobleskill..... 8

2d premium, Wheeler, Melick & Co., Albany $4
1st do thrasher, with cleaner and separator, Dow & Fowler, Fowlersville 5
2d do Hildreth & Co., Lockport 3
1st do hay, straw and corn stalk cutter, new principle, Pitts & Brayley, Rochester 5
1st do fanning mill, A. Higley, Bristolville 5
2d do J. & F. Miles, Rochester 3
1st do corn stalk and hay cutter, Barton & Milliner, Rochester, 5
2d do Dow & Fowler, Fowlersville 3
1st do clover mill and cleaner, Birdsall & Brokaw, West Henrietta 6
1st do corn sheller, horse power, C. J. Legg, Penn Yan 8
2d do Samuel Richardson, Rochester 6
1st do hand power, Leavenworth & Mason, Rochester 6
2d do W. D. Burrill, Geneva 4
1st do buckwheat scourer, B. T. Trimmer, Rochester 6
1st do vegetable cutter, John R. Robertson, Syracuse 6
2d do Whiteside, Barnett & Co., Brockport 4
1st do horse hay rake, Truman P. Downs, Brighton 4
Best arrangements for unloading hay, N. Palmer, Greenville 3
2d do M. D. Myers, Ilion 2

Discretionary.

Hand grain separator, Chapman & Sprague, Rochester ..... S. S. M.
1st premium overshot thrasher and cleaner, G. Westinghouse & Co., Schenectady ..... Dip.
2d do J. M. Harvey & Son, Amsterdam ..... S. S. M.
Pole and pruning shears, Thomas Evans, Watkins ..... P. O. Rep.
Fruit gatherer, do do ..... Trans.
Apple and peach parer, and slicer and corer, D. H. Whittemore, Worcester, Mass ..... Dip. and Trans.
Clod crusher, W. D. Burrill, Geneva ..... Dip. and Trans.
Agricultural cauldron and steam boiler, D. R. Prindle, East Bethany ..... Dip. and Trans.
Bran duster, James Richareson, Lockport ..... Dip. and Trans.

No. 45. Hand Tools and Dairy Implements.

Largest collection of implements and tools, Emery Bros., Albany $20
1st premium grain cradle, Remington, Markham & Co., Ilion 3
1st do hay forks, Birdsley Sanford, Pitcher, Chenango county . 3
1st do six manure forks, Birdsley Sanford, Pitcher, Chenango county 3
1st do carpenter tools, Barton & Milliner, Rochester 5
1st do coopers' tools, C. Worden, Lockport 5
2d do Barton & Milliner, Rochester 3
1st do axes, Barton & Milliner, Rochester 5
Best churn, A. Rose, Penn Yan 3
2d do W. B. Hopkins, Oakfield 2
Best Cheese press, Roe & Blair, Madison, Ohio 3

Discretionary.

Cheese packer and turner, Rufus Scott, Rutland ... Norton's Agriculturist.
Sample of augurs, L. Zeigler, Rochester ..... Trans.
Cheese hoop, Roe & Blair, Madison, Ohio ..... Trans.
Reaper and mower knives, Sweet Bros., Syracuse ..... Dip.
Butter separator, Geo. W. Putnam, Peterboro ..... Farm Implements.
Carpenter tools, C. Worden, Lockport ..... Trans.

Atmospheric churn, Hiram Clark, Rochester..... Dip
Combined cream pump with hose attachment, Milo Richardson, Sherman, Chautauqua county..... Dip
Combined butter worker, washer, weigher and salter, W. H. Keeler, Sherman, Chautauqua county..... Dip.

No. 45 A. Steam Engines, &c.

1st premium stationary engine, J. E. Booth, Rochester..... S. M.
1st do hay and cattle scales, Sampson & Tibbitts, Troy..... S. M.
1st do improved drain tile and pipe machine, A. La Tourette, Waterloo..... S. M
1st do portable cider and wine mill, C. B. Hutchinson, Auburn. Dip

Discretionary.

Set barrel head machine, Jno. Greenwood, Rochester..... Dip.
Combined shingle and heading machine, Trevor & Co., Lockport..... Dip.
Model of cement tile drain machine, D. S. Ogden, New York..... Dip.
Self-acting cattle pump, Peter Fraer, West Springfield, Pa..... Dip.
Barrel head turner, Acker & Dougherty, Rochester..... S. M.
Re-sawing machine, Daniel Doncaster, Albany..... Dip.
Empire windmill, E. W. Mills, Marcellus..... Dip.
Reversable mower, H. L. Hopkins, Eaton..... Dip.
Eames' American water engine, E. D. Eames, Watertown..... S. M.
Burson's grain binder, L. H. Smith, Atkinson, Ill..... Dip
Mill stone dresser, James Richmond, Rochester..... Dip

Class V.—Grain, Seed, Vegetables and Dairy.

No. 46. Grain and Seeds.

1st premium,		white winter wheat, E. S. Hayward, Brighton.....	$5
1st	do	red winter wheat, Robert Bell, West Brighton.....	5
2d	do	Robert Bell, West Brighton.....	3
1st	do	red spring wheat, O. Howland, Auburn.....	5
1st	do	oats, Henry Wier, Pittstown.....	5
2d	do	C. C. Holton, Rochester.....	3
1st	do	winter barley, O. Howland, Auburn.....	5
1st	do	spring barley, E. S. Hayward, Brighton.....	5
2d	do	H. Wier, Pittstown.....	3
1st	do	Indian corn, J. Dewey, Rochester.....	5
1st	do	buckwheat, B. S. Carpenter, Elmira.....	3
2d	do	H. Wier, Pittstown.....	2
1st	do	millet, H. Wier, Pittstown.....	3
2d	do	H. Wier, Pittstown.....	2
1st	do	Timothy seed, O. Howland, Auburn.....	3
2d	do	C. C. Holton, Rochester.....	2
1st	do	12 ears yellow seed corn, R. H. Avery, Wampsville....	3
2d	do	B. S. Carpenter, Elmira.....	2
1st	do	12 ears white seed corn, H. G. Warner, Rochester.....	2
1st	do	12 ears sweet corn, R. H. Avery, Wampsville.....	3
2d	do	B. S. Carpenter, Elmira.....	2
1st	do	white beans, Henry Wier, Pittstown.....	5
2d	do	W. P. Ottley, Phelps.....	3
1st	do	flax seed, H. Wier, Pittstown.....	3

No. 47. Vegetables.

2d premium		celery, George Cooper, Irondequoit.....	2
1st	do	cauliflower, do do	3
2d	do	H. C. Heath, Rochester.....	2

1st premium, white table turnips, George Cooper, Irondequoit..... $3
1st do carrots, John Riley, Greece..... 3
2d do S. W. Hall, Elmira..... 2
1st do beets, C. F. Crossman, Rochester..... 3
2d do E. S. Hayward, Brighton..... 2
1st do parsnips, David Rudman, Rochester..... 3
2d do E. S. Hayward, Brighton..... 2
1st do onions, John Riley, Greece..... 3
2d do E. S. Hayward, Brighton..... 2
1st do cabbage, George Cooper, Irondequoit..... 3
2d do do E. S. Hayward, Brighton..... 2
1st do tomatoes, C. F. Crossman, Rochester..... 3
2d do H. C. Heath, Rochester..... 2
1st do purple egg plants, Geo. Cooper, Irondequoit..... 3
2d do H. C. Heath, Rochester..... 2
2d do sweet potatoes, H. C. Heath, Rochester..... 2
1st do lima beans, George Cooper, Irondequoit..... 3
2d do James M. Edwards, Brighton..... 2
2d do Windsor beans, Mrs. J. T. Van Namee, Pittstown..... 2
1st do lettuce, Mrs. J. T. Van Namee, Pittstown..... 3
2d do summer radishes, E. S. Hayward, Brighton..... 2
1st do winter radishes, do do 3
1st do double parsely, George Cooper, Irondequoit..... 3
2d do B. S. Carpenter, Elmira..... 2
1st do large squashes, John Riley, Greece..... 3
1st do field pumpkin, H. C. Heath, Rochester..... 3
2d do Charles Murray, West Brighton..... 2
1st do table potatoes, C. C. Holton, Rochester..... 3
2d do Andrew Jackson, Henrietta..... 2
Best and greatest variety of vegetables, presented in best condition, raised by exhibitor, George Cooper, Irondequoit..... Dip.
2d premium, C. F. Crossman, Rochester..... Trans.
Best Hubbard squash, R. H. Avery, Wampsville..... $3
2d do E. S. Hayward, Brighton..... 2

No. 48. Flour, &c.

1st premium, barrel flour, Stebbins & Co., Rochester..... Dip.
1st do domestic wheat bread, W. Wadsworth, Rochester..... Dip.

No. 49. Butter.

1st premium, butter made from 5 cows in 30 consecutive days, B. S. Carpenter, Elmira..... $20
2d do Theron Van Auken, Phelps..... 15
1st premium, 25 pounds of butter, made in June, John Shattuck, Norwich..... 15
2d do J. S. Holbert, Chemung..... 10
3d do Mrs. P. S. Bonesteel, Victor..... 5
4th do Samuel L. Seeley, Brighton..... Trans.
1st premium, 50 pounds made at any time, John Shattuck, Norwich.. $15
2d do Isaac Bower, Riga..... 10
3d do Henrietta B. Church, Riga..... 5

Girls under twenty-one years of age:
1st premium, lot of butter, Mary E. French, Warren, Herkimer county..... Silver Cup.
2d premium, Caroline V. Sawyer, (thirteen years old,) Chemung, Pair Butter Knives.

No. 50. Cheese.

One year old and over:

1st premium, cheese, 100 pounds, Theron Van Auken, Phelps..... $15

Less than one year old:

1st premium, cheese, 100 pounds, Rufus Scott, Rutland, Jefferson Co. 15
2d do A. M. Taylor, (pine apple,) Rushford, Allegany county.. 10
3d do Peleg Pendleton, (pine apple,) Norwich..... 5
1st do cheese vat and heater, William Ralph & Co., Utica, (Ralph's patent)..... Dip.
2d do O. O'Neill & Co., Utica, (Union Dairyman)..... $3

Discretionary.

The committee recommend a discretionary premium to H. & E. Cooper, Watertown, for a large size cheese vat and heater, suitable for cheese manufactories. Diploma.

Also, recommend a discretionary premium to J. Williams, Marcy, Oneida county, for extra fine samples of large cheese, each weighing respectively 1,000 pounds and 700 pounds, these cheese not competing for premiums. Diploma.

No. 51. Sugar and Honey.

1st premium, maple sugar, Isaac Bower, Riga..... $3
1st do Imphee sugar, J. H. Smith, Quincy, Ill..... Dip.

Honey.

1st premium, honey, Joseph Randolph, Webster, Monroe county..... $5
2d do E. S. Bacon, Albion..... 3
3d do Wm. Fenner, Henrietta..... Trans.
1st do bee hive K. P. Kidder, Burlington, Vt..... Dip.

Class VI.—Domestic Manufactures.

No. 52. Woolen Goods—No. 1.

Pair woolen blankets:

1st premium, Mrs. Abel Dryer, Brighton..... $8
2d do Mrs. Wm. H. Graves, Blossvale..... 6
3d do Miss C. Moschell, Clay..... 4

Ten yards woolen cloth:

1st premium, Mrs. Amos Clark, Marcellus..... 8
2d do Mrs. Wm. H. Graves, Blossvale..... 6

Ten yards woolen flannel:

1st premium, Mrs. D. C. Chapin, Henrietta..... 8
2d do Mrs. J. B. Noyes, Salina..... 6

Ten yards woolen carpet:

1st premium, D. Conger, Wolcott..... 8

Rag carpet, twenty yards:

1st premium, Mrs. S. C. Mason, Rochester..... 5
2d do Mrs. C. L. Dayton, Alden, Erie county..... 3
3d do Mrs. Emma S. Dyer, Penfield..... 2
4th do Mrs. B. S. Carpenter, Elmira..... Trans.

Ten yards woolen flannel, cotton warp:

1st premium, Mrs. H. Wier, Pittstown..... $8
2d do Mrs. H. Lamb, Fulton..... 6
3d do Mrs. A. Bristol, Adams Centre..... 4
4th do do do ..... Trans.

Discretionary.

Ten yards woolen cloth, (check,) Mrs. J. B. Noyes, Salina..... Trans.
Ten yards fulled cloth, Mrs. A. Bristol, Adams Centre..... Fitch.

Piece domestic flannel, Asahel Byington, Albion.....,.Commended
Splendid assortment of carpets and rugs, Howe & Rogers, Rochester
Diploma
Three pieces cassimere, Waldo, Steele & Co., China, Wyoming county
Diploma.
Ten yards rag carpet, Mrs. D. McArthur, Batavia.....Commended.
Woolen or kersey blankets, Mrs. O. Howland, Auburn.....Commended.

No. 53. Domestic Manufactures—No. 2.

Double carpet coverlet:
1st premium, D. Conger, Wolcott..... $5
2d do Mrs. Jenette Lincoln, Spencerport..... 3
3d do Mrs. Abel Dryer, Brighton..... 2
4th do Mrs. Wm. H. Graves, Blossvale.....Trans.
Knit bed spread:
1st premium, Mrs. F. Vose, Rochester..... $3
2d do Mrs. J. Lovecraft, Rochester..... 2
3d do Mrs. S. W. Scott, Greece..... 1
White wove bed spread:
1st premium, Mrs. H. Wier, Pittstown..... 3
2d do Mrs. Samuel L. Seeley, Brighton..... 2
3d do Mrs. A. Bristol, Adams Centre..... 1
Woolen socks for gentlemen, by girls under twelve years of age:
1st premium, Miss Mary Ann Lamb, Fulton..... 2
Woolen stocking yarn:
1st premium, Mrs. James B. White, Leicester, Livingston county.... 2
2d do Mrs. Amos Clark, Marcellus..... 1
Woolen knit stockings:
1st premium, Mrs. James B. White, Leicester..... 2
2d do J. V. Dewey, Penfield..... 1
Worsted knit stockings:
1st premium, Mrs. Mary Shattuck, Penfield..... 2
Woolen fringe mittens:
1st premium, Mrs. James B. White, Leicester..... 2
2d do Mrs. Amos Clark, Marcellus..... 1

Discretionary.

Worked bed spread, J. V. Dewey, Penfield.....Dip.
Cheneille worked bed spread, Mrs. H. Lamb, Fulton.....Dip.
Striped mittens, Mrs. J. B. White, Leicester.....Dip.
Pair crotchet mittens, Mrs. D. J. Hale, Rochester.....Trans.
Lady's comforter, Mrs. S. M. Douglass, Rome.....Trans.
Knit tidy, Miss R. L. Bowman, Rochester.....Vinedresser.
Knit shawl, Miss M. A. Ryan, Newport, Herkimer county..Florist's Guide.

No. 54. Domestic Manufactures—No. 3.

Ten yards linen:
1st premium, Mrs. H. Wier, Pittstown..... $8
2d do Mrs. Wm. H. Graves, Blossvale..... 6
Ten yards linen diaper:
1st premium, Mrs. C. L. Dayton, Alden, Erie county..... 8
2d do Mrs. A. Bristol, Adams Centre..... 6
3d do Mrs. H. Wier, Pittstown..... 4
Ten yards linen kerseys:
1st premium, Mrs. Amos Clark, Marcellus..... 8
2d do Mrs. H. Wier, Pittstown..... 6
3d do Mrs. C. L. Dayton, Alden..... 4
4th do Mrs. H. A. Brown, Rochester.....Trans.

10 yards tow cloth:
1st premium, Mrs. Wm. H. Graves, Blossvale $4
2d do Mrs. H. Wier, Pittstown 2
Cotton knit stockings:
1st premium, Mrs. A. Bristol, Adams Centre 2
2d do Mrs. Amos Clark, Marcellus 1
Linen knit stockings:
1st premium, Mrs. Ezra Bishop, Attica 2
2d do Mrs. C. L. Dayton, Alden 1
Linen sewing thread:
1st premium, Mrs. Ezra Bishop, Attica 2
2d do Mrs. H. Wier, Pittstown 1

No. 55. Needle Work, &c.

Collar and sleeve embroidery:
1st premium, Mrs. J. V. Ditmar, Waterloo 3
2d do Mrs. M. Kemp, Syracuse ..... Pardee on Strawberry.
Lace embroidery (mantilla):
1st premium, Mrs. M. Kemp, Syracuse $3
2d do Mrs. E. T. Crocker, Syracuse ..... Vinedresser's Manual.
Scarf and bag embroidery:
1st premium, Mrs. F. H. James, Brighton $3
Crotchet shawl:
1st premium, Mrs. A. White, Henrietta 3
Hair jewelry:
1st premium, Mrs. C. S. W. Griffen, Rochester 3
Muslin embroidery:
1st premium, Mrs. D. C. Chapin, Henrietta 3
2d do Mrs. N. J. Rice, Henrietta ..... Vinedresser.
Cheneile embroidery (picture):
1st premium, Mrs. M. Glienke, Rochester $3
Embroidered tidy on black canvas:
1st premium, Mrs. E. T. Crocker, Syracuse 3
Embroidered affghan:
1st premium, Mrs. John Craig, Rochester 3
2d do Mrs. W. W. Carr, Rochester ..... Vinedresser's Manual.
Knit hood:
1st premium, Mrs. E. T. Crocker, Syracuse $3
Knit sofa cushion:
1st premium, Miss Clara B. Hawley, Rochester 3
2d do do do do ..... Rose Culturist.
Pencil drawing from nature (flowers), by lady:
1st premium, Miss Helen M. Chapel, Brockport $3
Water color painting, by lady:
1st premium, Mrs. E. T. Crocker, Syracuse 3
2d do do do ..... Rose Culturist.
Oil color drawing from nature, by lady:
1st premium, Mrs. Dr. Crittenden, Rochester ..... Dip.
2d do Mrs. M. A. Codding, Rochester ..... Rose Culturist.

Discretionary.

Transfer work, Mrs. E. T. Crocker, Syracuse ..... Cranberry Culture.
Knitted tidy, Mrs. F. Vose, Rochester ..... Reemelin on the Vine.
Crotchet sacque, G. N. Truesdale, Rochester ..... Pardee on Strawberry.
Crotchet infant's dress, G. A. Truesdale, Rochester ..... Trans.
Leather work, Mrs. R. S. Bowman, Rochester ..... Am. Florist's Guide.

Farmer's wreath, very beautiful, Miss S. J. Vosburgh, Rochester, Norton's Agriculture.
Oriental painting, Mrs. Eliza Hall, Scottsville.....Pardee on Strawberry.
Crotchet vest, G. N. Truesdale, Rochester.....Norton's Agriculture.
Crotchet lace, Mrs. Ezra Bishop, Attica... ....Pardee.
Bed spread, Mrs. Elizabeth Seager, Spencerport.....Florist's Guide.
Embroidered table spread, Mrs. J. V. Ditmar, Waterloo.....Reemelin.
Crotchet mittens, Mrs. D. J. Hale, Rochester.....Pardee.
Braid collar, Mrs. E. T. Crocker, Syracuse.....Pardee.
Patchwork cushion, Mrs. Edward Dagg, Rochester.....Trans.
Embroidered handkerchief, Mrs. D. J. Hale, do Burt's Family Gardener.
do do Mrs. S. H. Goodwin, Oneida, Buist's Kitchen Garden.
Linen embroidery, Mrs. R. M. Dalzell, Rochester....Ladies' Flower Garden.
do Mrs. S. H. Goodwin, Oneida.....Pardee.
Crotchet collar and cuff, do do .....Trans.
Scarf embroidery, Mrs. F. H. James, Brighton .....Pardee.
Tatting collar, Mrs. M. J. Hale, Honeoye Falls.....Pardee.
Crotchet tidy, Mrs. D. J. Hale, Rochester.....Ladies' Flower Garden.
Crotchet cake basket cover, Mrs. Ezra Bishop, Attica..Cranberry Culture.
Crotchet sontag, Miss E. Penden, Rochester.....Pardee.
Crotchet worsted Tidy, Mrs. E. T. Crocker, Syracuse.....Florist's Guide.
Silk embroidered table spread, Mrs. H. Hartman, Rochester.....Diploma.

No. 56. Needle Work, &c.

Worsted embroidery:
1st premium, Mrs. F. H. James, Brighton..... $3
2d do Margaret Ann Lynden, Rochester....Vinedresser's Manual.
Chair (cushion and back):
1st premium, Mrs. John Craig, Rochester $3
2d do Mrs. George B. Redfield, Rochester.....Rose Culturist.
Ottoman cover:
1st premium, Mrs. Mary J. Brown, Rochester..... $3
2d do Mrs. E. T. Crocker, Syracuse.....Rose Culturist.
Embroidered melodeon cover:
1st premium, Mrs. John Craig, Rochester..... $3
2d do table spread, Mrs. F. H. James, Brighton.....Pardee.
Wax fruit:
1st premium, Mrs. Louis Chapin, Rochester..... $3
2d do Miss Juliet Jones, Rochester.....Pardee.
Ornamental shell work:
1st premium, Mrs. Louis Chapin, Rochester..... $3
Wax flowers:
1st premium, Mrs. Maria N. Davis, Rochester..... 3
2d do Miss Juliet Jones, Rochester.....Florist's Guide.
White quilt:
1st premium, Mrs. George Ressiguie, Somerset, Niagara county..... $3
Silk quilt:
1st premium, Miss A. Hyatt, Rochester 3
2d do Miss Mary E. Hedges, Rochester.....Rose Culturist.
Patchwork quilt:
1st premium, Mrs. H. D. Longfellow, West Henrietta..... $3
2d do Mrs. S. C. Mason, Rochester.....Rose Culturist.
Plain sewing:
1st premium, Mrs. H. Lamb, Fulton..... $3
2d do Mrs. B. S. Carpenter, Elmira.....Rose Culturist.

Hair flowers:
1st premium, Miss M. J. Hale, Honeoye Falls..... $3
2d do Mrs. H. V. Harroun, Fairport.....Rose Culturist.
Bead work:
1st premium, Miss E. Penden, Rochester..... $3

Discretionary.

Quilt, by girl 8 years old, Miss L. Hyatt, Rochester.....Rose Culturist.
Patchwork quilt, Mary Ella Carpenter, Elmira, (12 years).....Pardee.
Woolen overshoes, Mrs. Ezra Bishop, Attica.....Trans.
Moss landscape, Mrs. Louis Chapin, Rochester....Ladies' Flower Garden.
Fire screen and cut stand cover, Mrs. John Craig, Rochester.....Pardee
Plain sewing, Mrs. J. T. Van Namee, Pittstown.....Trans.
Worsted embroidered sofa pillow, Mrs. E. Bottum, Rochester.....Trans.
Case millinery goods, N. Kemp, Rochester.....Dip.
Worsted embroidered sofa and chair tidy, Mrs. C. W. Colton, Boonville.....Buist's Garden.

Class VII.—Miscellaneous Department.

No. 57. Paintings, &c.

1st premium, fruit drawing, A. Hochstein, Rochester ..... Dip.
1st do photographs, O. B. Evans, Buffalo..... Dip.
1st do bookbinding, F. H. Marshall, Rochester..... Dip.
1st do ornamental penmanship, Bryant, Stratton & Co., Buffalo, Dip.
1st do business penmanship, D. T. Ames, Syracuse..... Dip.

The committee saw with pleasure, a large collection of colored lithographs and theorems of flowers and fruit, but while admitting their excellence, the committee do not judge them as drawings or paintings in the proper signification of that term.

As conveying the most valuable knowledge to all fruit growers of the kind of fruit in existence, the committee suggest that a separate class be formed, which shall include all these.

The committee would have recommended for the exquisite photography which they have selected as worthy of the award—a gold medal—but for the fact that such honorable reward has already been given. In this collection, the judgment of the committee was very strongly expressed in relation to the ivorytypes.

No. 58. Silver Ware, Cutlery, &c.

1st premium, set optical instruments, J. J. Bauch & Co., Rochester... Dip.
1st do dental instruments, E. L. Wood, Brockport..... Dip.
Thermometer, Lent & Tower, Rochester..... Dip.
do A. S. West, Rochester..... Dip.
do D. E. Lent, Rochester..... Dip.
Barometer for common use, Lent & Tower, Rochester ..... Dip.
do Lyman King, Clifton Springs..... Dip.
do Mrs. Martha Wrenn, Rochester..... Dip.

No. 59. Stoves—(*Cooking.*)

1st premium, elevated oven cooking stove, for wood, M. Huntington & Co., Rochester, "Tribune"..... Dip.
1st premium, low oven cooking stove, for wood, M. Huntington & Co., Rochester, "Benefactor"..... Dip.
2d premium, low oven cooking stove, for wood, F. Sprague, Rochester, "Stewart's".....Trans.
1st premium, low oven cooking stove, for coal, Southworth & Callender, Rochester, "American"..... Dip.

2d premium, low oven cooking stove, for coal, Siddons & Co., Rochester, "Triumph" ..... Trans.
1st premium, furnace or other apparatus for warming houses, E. E. Sill, Rochester, "Continental" ..... Dip.

No. 60. STOVES—(*Parlor*).

1st premium, ornamental parlor stove, F. Sprague, Rochester, "Stewart's Coal" ..... Dip.
2d do Kline & Duthe, Rochester, "Trojan" coal ..... Trans.
1st premium, ornamental parlor stove for wood, M. Huntington & Co., Rochester ..... Dip.
1st premium, hall stoves, Siddons & Co., Rochester, Treadwell & Hales' patent self-feeding, revertible flue, double heating parlor and hall stove "Excelsior," manufactured by Jno. F. Rathbone, Albany .. Dip.
2d premium, hall stove, Kline & Duthe, Rochester, "Davis' Gas Burner," ..... Trans.

No. 61. LEATHER, INDIA RUBBER GOODS, &c.

1st premium, trunks and traveling bags, Pritchard & Bro., Rochester, Dip.
1st do carpet bags, R. C. Combs, Rochester ..... Dip.
1st do exhibition of boots and shoes, R. C. Combs, Rochester .. Dip.
1st do exhibition of ladies' work boots and shoes, R. C. Combs, Rochester ..... Dip.
1st do carriage harness, T. D. Kempton, Rochester ..... Dip.
1st do single harness, T. D. Kempton, Rochester ..... Dip.

No. 62. CABINET WARE.

1st premium, cradle chair, J. H. Haven, Lewiston, Niagara county ... Dip.
1st do bedstead with spring bed, C. C. Bisbee, Rochester ..... Dip.

No. 63. CARRIAGES.

1st premium, double carriage, James Cunningham, Rochester ..... Dip.
1st do single top buggy, James Cunningham, Rochester ..... Dip.
1st do single riding buggy, James Cunningham, Rochester .... Dip.
1st do pleasure wagon, W. S. Hoyt, Ithaca ..... Dip.
Best collection of carriages and wagons, James Cunningham, Rochester, Dip.

Discretionary.

Children's wagons and sleighs, T. T. Laing, Rochester ..... Dip.
Self-acting brake, Daniel Sager, Albany ..... Dip.

No. 64. CLOTHING, HATS, FURS, &c.

1st premium, men's hats and caps, George Clark, Rochester ..... Dip.
1st do children's hats and caps, Geo. Clark, Rochester ..... Dip.
1st do furs, Geo. Clark, Rochester ..... Dip.

Discretionary.

Ladies' cloaks, Hubbard & Northrop, Rochester ..... Dip.

No. 65. SAFES.

1st premium, fire-proof safe, Martin Briggs, Rochester ..... Dip.
1st do burglar-proof safe, Martin Briggs, Rochester ..... Trans.

No. 66. SEWING MACHINES.

1st premium, family sewing machine, D. E. Rice, Rochester, (Sloat's) .. Dip.
1st do machine for manufactories, H. C. Jones, Rochester, (Singer's) ..... Dip.
1st do double thread machine, S. W. Dibble, Rochester, (Wheeler & Wilson's) .. .. Dip.

1st premium, single thread machine, Aaron Palmer, Brockport, (Madam D'Emorest's) ..... Dip.
1st do sample of work on sewing machine, V. C. Goodwin, Rochester, (Grover & Baker's) ..... Dip.

No. 67. Pianos and Musical Instruments.

1st premium, parlor grand, D. Parmeley, Rochester, (Lighte & Bradbury) ..... Dip.
1st do square grand, Fred. Starr, Rochester ..... Dip.
1st do melodeon, D. Parmeley, Rochester, (Carhart & Needham) Dip.
1st do collection of musical instruments, D. Parmeley, Rochester. Dip.

Discretionary.

Church and school harmoniums, made by Carhart & Needham, D. Parmeley, Rochester ..... Dip.
Sliding key board, W. F. Sheldon, East Mendon ..... Dip.
Kurtzman & Heinze's pianos, G. H. Ellis, Rochester ..... Dip.

No. 68. Domestic Pure Wines, &c.

1st premium, Isabella wine, Pleasant Valley Wine Co., Hammondsport. Dip.
1st do Catawba wine, Pleasant Valley Wine Co., Hammondsport ..... Dip.
1st do native grape wine, Pleasant Valley Wine Company, Hammondsport ..... Dip.
1st do white currant wine, Ellwanger & Barry, Rochester ..... Dip.
1st do elderberry wine, Mrs. John Dorsey, Bath ..... Dip.
1st do raspberry wine, do do do ..... Dip.

No. 69. Discretionary.

The labors of the committee in this class were very arduous. The number of entries exceeded two hundred and fifty, and the number of articles upwards of three hundred. It is believed that all the articles were examined that were on exhibition.

E. Darrow & Brother, Rochester, sample globes and stationery, Favorable notice and Dip.
J. H. Thurber, Rochester, Amidon's improved clothes wringer ..... Dip.
W. Corris & Co., Rochester, set carriage wheels, spokes, hubs, &c., Favorable notice and Dip.
T. C. Stanton, Rochester, Noble & Cooley's snare drum ..... S. S. Med.
C. B. Woodworth, Rochester, superior samples perfumery ... Dip. and S. M.
C. B. Woodworth, variety toilet soaps ..... Trans.
Mrs. Samuel Hamilton, Rochester, sea moss boquet .. Manual of Gardening.
Mrs. A. M. Sennett, Rochester, specimen cone work ..... Fitch.
Benjamin N. Payne, Albany, jar superior tobacco ..... Dip.
S. G. Crain, Rochester, hospital chair, .. Favorable notice and P. O. Report.
Kritch & Co., Rochester, iron axles ..... Dip.
Martin Beir, Rochester, specimens kerosene oil. Favorable notice and P. O. R.
Ekins Hand, Rochester, sad iron stand ..... Favorable notice and P. O. R.
Doct. D. Bly, Rochester, artificial legs ..... Favorable notice and Dip.
Burke, Fitzsimmons, Hone & Co., Rochester, Bradley's spiral hoop skirt ..... Dip.
William Robinson, Rochester, model for watering and showering cattle on railroad cars ..... Fav. N. and P. O. R.
Barton & Milliner, Rochester, hay knives, grubbing hoes, &c. .... S. S. Med.
Barton & Milliner, Rochester, fruit ladder ..... P. O. R.
William Lines, Rochester, coal ash sifter ..... P. O. R.

Martin Briggs, Rochester, Covert's patent permutation bank locks, Fav. N. and Dip.

do do iron railing, iron chairs, settees and vases, S. S. Med.

D. Mitchell, Rochester, perfumery, very superior.....Fav. N. and S. Med.

C. W. Forkel, Rochester, pencil likeness, Washington and Napoleon..Dip.

Alexander Allen, Rochester, small clock movement and small hand drill.....Fav. N. and Dip.

Barton & Milliner, Rochester, sample of skates.....P. O. R.

Wheeler & Wilson, manufacturing company, S. W. Dibble, agent, patent umbrella stand.....Fitch.

S. B. Dewey, Rochester, variety kerosene lamps.....P. O. R.

Schutle & Sader, Rochester, picture frame.....P. O. R.

A. McGuffie, Rochester, model iron bridge.....P. O. R.

E. E. Sill, Rochester, agricultural steam cauldrons and steam boxes for do.....Fav. N. and Dip.

G. G. Townsend, Rochester, assortment shoemaker's tools.....Dip.

Miss Francis Dryer, Brighton, pencil likeness of child, Landscape Gardening.

Joseph Dixon & Co., New York, stove polish.....Fitch.

James Pyles, New York, O. K. soap, dietetic saleratus, cream tartar, baking soda, and various other articles.....Dip. and S. Med. with special commendation of the executive committee for the great excellence of the articles exhibited.

Edward Heylyn, Rochester, case artificial fishing flies.....Dip.

Mrs. D. B. Gray, Chili, pencil portrait.....Fitch.

L. Brown, Rochester, leather ink.....P. O. R.

L. P. Dodge, Newburgh, model farm pump, apparently very useful invention.....Vol. Trans.

J. E. Cheney, Rochester, clothes wringer, India rubber washing machine and water fillers.....Fav. N. and Trans.

Mrs. Catherine Lee, Rochester, specimens cone work....Thomas on Fruits.

H. Glass, Lima, steam clothes washer and wringer.....P. O. R.

A. R. Pritchard & Bro., Rochester, military goods, infantry accoutrements.....Dip.

Julius Ives & Co., New York, agents universal clothes wringer..S. S. Med. and Dip.

F. Stahbredt, Rochester, superior domestic segars.....Dip.

J. Waugh, Elmira, metallic plate cutting machine.....S. S. Med.

J. Waugh, Elmira, boring machine and paper trimming machine..P. O. R.

G. Voorhes, Elmira, tenoning machine.....Vol. Trans.

S. C. Crittenden, Rochester, case of dentistry.....Dip.

Josephus Harris, Boston, Mass., clothes wringer.....Trans.

G. Grinard, Buffalo, French and German mustard.....P. O. R.

Robert Bunker, Rochester, case insects.....Fitch.

J. J. Van Zandt, Rochester, coffee and spices.....P. O. R.

J. B. Clough, Brighton, plow handles.....P. O. R.

A. M. Badger, Rochester, well curb and bucket, and school desk..P. O. R.

W. Webster, Rochester, plan 1st class park, fair buildings and model of Swiss garden.....Fav. N. and Kemp on Landscape Gardening.

B. A. Shultz, bird cage.....P. O. R.

Winslow & Co., Rochester, patent adjustable side wrenches..Fav. N. and Vol. Trans.

George Race, Norwich, portable well windlass.....S. S. Med.

George Dare, Auburn, window sash and frame.....P. O. R.

Charles Hine, Lockport, horse shoes, very superior.....Dip.

J. Fink, Baldwinsville, safety hook whiffle trees.....P. O. R.

F. S. Pease, Buffalo, improved engine and signal oils, and a great variety of oils of great excellence.....Dip. and S. Med., with special commendation of the executive committee for the great excellence as well as varieties of articles exhibited.

John S. Brooks, agent, Rochester, sad iron heater and gridiron..Fav. N. and P. O. R.

Howden, Colby & Co., Waterbury, Vermont, Colby's patent clothes wringer.....Dip. and S. S. Med.

Howden, Colby & Co., Waterbury, Vermont, rubber band carpet sweeper.....Vol. Trans.

Mrs. S. M. Douglass, Rome, magic copying paper.....P. O. R.

Albert Philips, Dryden, Johnson's washer and wringer.....Vol. Trans.

do do carriage gate and pinion hinge.....P. O. R.

J. & J. C. Hoyland, Rochester, cracker machine and brake....Vol. Trans.

D. B. De Land & Co., Fairport, specimens of saleratus.....S. S. Med.

Charles Murray, West Brighton, camp bedstead and stool combined, P. O. R.

F. Brown, Conquest, pair thills, worthy notice.....P. O. R.

Peter Van de Sande, Seneca Falls, cast steel spring skates.....P. O. R.

George Beardsley, Ithaca, log cabin.....Downing on Fruit.

Norris Black, Toronto, Canada, artificial limbs....Fav. N. and Vol. Trans.

John E. Davis, Ithaca, Dr. Pitt's kerosene lamps.....P. O. R.

H. Wing, Buffalo, crimp machines.....P. O. R.

J. H. Vandenburgh, Albany, knife, fork and spoon scourer.....P. O. R.

A. T. Peck, Scott, butter package.....P. O. R.

John Bell, Rochester, step ladder with improved fastening.....P. O. R.

Richard Punch, Rochester, case of teeth.....Norton's Ag.

John F. Rothgangal, Rochester, specimens of glue.....S. S. Med.

do do specimens of curled hair.....Trans.

John Dufuer, Rochester, lasts, crimps, boot trees and clumps....S.S. Med.

W. S. Loughborough, Rochester, six varieties of planes.....P. O. R.

S. L. Avery, Norwich, tire upsetter (wagon).....P. O. R.

George D. Teller, Buffalo, patent ankle supporting skate.....Dip.

D. R. Adams, Salisbury, patent portable iron shrinker, &c.....Fitch.

H. P. Gill, Ogden, revolving handle for moulding planes.....P. O. R.

N. S. Gilbert, Lockport, fruit jars.....Thomas' Fruits.

James Forncrook, Hermitage, machine for setting and upsetting saw teeth.....P. O. R.

J. H. Forbes, Hornellsville, natural toilet stand and what-not.....P. O. R.

Augustus Maxon, Waterloo, case dentistry.....P. O. R.

D. W. Seeley, Albany, Caswell's brick machine and pressed brick from dry clay; referred to special committee, who examined a working model in operation, and recommend it as a machine of great value.....Dip.

T. J. Stratton, Geneva, yeast compound.....P. O. R.

O. L. Davis, Rochester, toilet, washing and erasive soaps.....S. S. Med.

J. D. Harrington, Rochester, life saving raft and moving battery..P. O. R.

S. L. Avery, Norwich, model of water drawer.....P. O. R.

J. A. Lafler, Gaines, model of brick machine and mould for making brick.....Dip.

John W. Stewart, Penn Yan, floral design, pressed flowers, mosses and lichens.....Dip.

Haines & Pell, New York, wringing machine.....S. S. Med.

do do truck with bagholder attached.....Trans.

T. Larter, Cleveland, Ohio, samples blacking, good.....P. O. R.

Lewis & Powell, Rochester, samples paraffine and other oils.....Dip.

do do refined asphaltum.....Trans.

Charles Kathern, Cleveland, Oswego county, car glass lights for locomotives, etc., etc.....Dip.
Silas Hewet, Seneca Falls, model of clod crushing cultivator.....P. O. R.
M. Easterbrook, Geneva, willow peeling machine.....Dip.
Hutchinson & Lyon, Cayuga, petroleum, no chimney burner.....P. O. R.
George E. Slocum, Scottsville, coffee and tea pot.....P. O. R.
A. Brown, Rochester, improved quilting frame.....P. O. R.
B. J. C. Howe, Syracuse, mica lamp chimney.....S. S. M.
A. B. Porter, Auburn, spring bed.....Fitch.
W. & L. Hotchkiss, Addison, plow handles, wagon hubs and horse shoes.....P. O. R.
Byron Rice, West Schuyler, model thrasher and cleaner.....S. S. M.
W. L. Fish & Co., Newark, N. J., Fisher's nursery night lamp.....Dip.
Jerome Kidder, New York, electro magnetic machine.....Dip.
J. A. Prescott, Sandy Hill, mill saw gummer, saw upset and swege..Fitch.
A. Jeffry, Rochester, ten jars can fruit.....Fitch.
D. L. Halleck, Westbury, samples Halleck's new mode of tanning hides, furs, skins, etc.; sample gloves, mits and capes.....Dip.
O. J. Hall, Pittsford, patent railroad chair.....P. O. R.
H. J. Chase, Rochester, shingles.....P. O. R.
L. H. Buell, New York, washing machine.....Dip.
B. D. Schuyler, Henrietta, model of road scraper.....P. O. R.
C. B. Lawrence, Nunda, patent metallic lubricating composition..P. O. R.
Boss Brothers, Binghamton, extra chemical writing fluid, superior, manufactured by the American ink company.....Dip. and S. Med.

We, the undersigned, clerks in the business office of the New York State Agricultural Society, at the exhibition held in Rochester, 1862, having used the Boss Brothers' "chemical writing fluid" during the business of the fair, are unanimous in our recommendation of it as a very superior article of ink. It being free from any sediment, flows readily, and is of a beautiful velvety black color. It embraces so many valuable requisites in a good article of ink, that we cordially recommend it to the public. We also suggest that the Executive Board of the Society award a diploma to the manufacturers.

J. B. CUSHMAN, Utica.
C. F. WILLISTON, Syracuse.
S. A. BUNCE, Vernon Centre.
CYRUS HAYDEN, Parma.
JOHN HAROLD, Hempstead.
S. R. EARLS, Agricultural Rooms.
J. K. SEAVER, Malone.
J. C. CUYLER, Albany.
GEORGE J. GARDNER, Syracuse.
DE WITT C. DE FOREST, De Friestville.

T. G. G. Pettingell, Clarendon, improved carpet hook.....P. O. R.
Charles Cavender, Lyons, peppermint oil.....P. O. R.
Henry T. Autis, Canandaigua, specimen ivory carving.....Dip.
A. E. Taylor, Ogdensburgh, patent door bell.....Norton's Ag.
Simeon Hayes, Prattsburgh, ornamental trellis.....P. O. R.
P. Anderson, Norwich, water drawer.....P. O. R.
E. R. Marauville, Castleton, Vt., calendar clock.....Dip.
L. B. Hotchkiss, Phelps, oil of peppermint and oil of spearmint..S. S. Med.
Webster Smith, Syracuse, Haws' patent clothes dryer.....P. O. R.
J. G. Greenway & Co., Syracuse, cask XXX ale.....Dip.
Thomas Lunn, Syracuse, Lunn's camphor ice.....Dip.

Mrs. John Dorsey, Bath, Steuben county, wedding cake five years old.Dip.
do do do fine samples tomato catsup and currant wine.....Dip.

Beach & Cleveland, Penn Yan, set machinery for flax and cotton.

The committee have no adequate award for the above machine, and respectfully ask the Executive Committee to consider and give one suitable. We consider it of great importance, and would cheerfully and earnestly recommend it to the notice of the Executive Committee. (The Executive Committee intend to test this machine and such others as may be presented, at an early day.)

Dr. George H. Smith, Rochester, Smith's air light.....S. M.

The light was exhibited before the Executive Committee one evening during the fair, and promises to accomplish all that is claimed for it, and is one of the most valuable inventions of the day. The annexed statement of this invention shows its great importance.

Smith's Air Light, for Locomotives and other Railway Uses, Light-Houses, Streets, Halls, etc.

This valuable invention, for the production of powerful lights, results from the discovery of a method, hitherto unattained, of supplying an unlimited amount of oxygen gas, obtained without expense from the atmospheric air, to one or more jets of carburetted hydrogen or common illuminating gas, thereby intensifying the combustion of said jets to such a degree that when they impinge upon a small cylinder of lime, the lime is heated to so high a degree of incandescence as to generate and emit a powerful white light, which, when placed in the focus of a parabolic mirror, furnishes practically the most brilliant light for locomotive head lamps, and other purposes, ever constructed; the great economy of the same, arising from the small amount of common gas, say four feet per hour, (the only source of expense, saving the trifling cost of the lime,) enhances greatly its value, as the air light, consuming four feet per hour, will give as much light as four to six common gas burners, each using at least four feet per hour.

The form of the invention exhibited belongs to the class of lights wherein a solid substance, as lime or platina, or their equivalent, is rendered incandescent by jets of ignited gases, or electricity—their jets only furnishing heat—as contradistinguished from common gas burners or oil lights, where the light is derived from a flame. The ox-hydrogen, or Drummond light, is the most prominent of the former class; wherein an ignited jet of oxygen and hydrogen gases renders a small ball of lime incandescent. This light has been found impracticable for ordinary purposes, from the necessity of manufacturing oxygen and hydrogen; the former expensive, and both inconvenient of preparation—the lime, at the same time, being destroyed with great rapidity.

In the long series of experiments extending over three years, resulting in the new light, it was found that carburetted hydrogen, or common gas, was preferable to hydrogen, the lime remaining durable under its action, while the gas was cheap, and readily obtained. Also that (the air containing a certain proportion of oxygen), by a properly constructed burner, a

harmless decomposition could be effected at the moment of combustion, and an abundant supply of oxygen obtained for maintaining in jets an active ignition of the common gas—thus generating the intense heat essential to the high incandescence of the lime, and so producing a light as powerful as the ox-hydrogen, with no other material of cost than that of a common gas burner and a little lime.

This result confers, from its power and brilliancy, great safety to railway trains at night; also to steamers and shipping. It is equally valuable in light-houses. From its economy it is of great value, not only for the preceding uses, but for streets, churches, halls, rooms, &c.

Its power is proven from the fact that fine print can be read at a distance of more than 2,000 feet from the light. Its economy, that such a light costs but twelve mills per hour.

The character of the light is shown from photographs having been taken with it.

For portable purposes, as locomotive lights, the gas is carried in two holders of light iron, placed permanently underneath, communicating by pipes with the burner. They are charged at the engine house before starting. The evenness of flow to the burner is insured by a simple, but accurate regulator.

The apparatus is durable, and more easy of control than an oil lamp.

For stationary light, the gas is supplied in the same manner as to a common gas burner.

Evan's Rotary Digger. H. C. Hepburn, New York. Report of the Committee on "Evan's Rotary Digger," exhibited at the New York State Fair at Rochester, October, 1862:

The undersigned committee, appointed to examine "Evan's Rotary Digger," exhibited by Mr. H. C. Hepburn, at the State Fair at Rochester, respectfully report, that the machine was submitted to them in operation on a field near the Fair grounds. The soil was a loam of medium texture, between the sandy and clayey, and had been cropped the past season with beans. The machine was drawn by a pair of farm horses rather under the average strength, making at each passage over the field a cutting *twenty inches wide and eight or nine inches deep.* It moves on three wheels, and weighs in its present condition, as stated to the committee, 1,200 lbs. The operation of the revolving teeth or diggers upon the soil is similar to forking. One passage over such soil as that on which it was tested before the committee, appeared to loosen and pulverize it to the full depth of the teeth or diggers; but when twice passed over the same cutting, the weeds and grass had nearly all disappeared, and the soil rendered so loose that persons walking over it sank as they would in a mass of newly fallen snow.

The committee take pleasure in saying that, on the whole, they have been well pleased with what they have seen of the practical working of "Evan's Rotary Digger," and concur in the opinion that it is in a fair way of being made a machine of great value for the pulverization of the soil.

All of which is respectfully submitted.

LEWIS F. ALLEN, of Erie,
SAMUEL L. FULLER, of Livingston,
P. BARRY, of Monroe,
Committee.

CLASS VIII.—HORTICULTURAL DEPARTMENT.—FRUITS.

No. 70. CLASS 1. PROFESSIONAL LIST.

Cut Flowers.

Display:
1st premium, Ellwanger & Barry, Rochester $10
2d do J. Donelson & Co., do .....S. Med.

Dahlias.

Collection:
1st premium, Wm. Brown Smith, Syracuse..... $6
2d do C. J. Ryan & Co., Rochester 3
Twenty-four dissimilar blooms:
1st premium, Wm. Brown Smith, Syracuse..... 5
2d do Ellwanger & Barry, Rochester 3
Twelve dissimilar blooms:
1st premium, W. Brown Smith, Syracuse 3
2d do J. Donelson & Co., Rochester..... 1
American seedling, not before exhibited:
1st premium, W. Brown Smith, Syracuse..... 1

Roses.

Greatest number, and newest and best varieties:
1st premium, Ellwanger & Barry, Rochester 8
2d do Frost & Co., Rochester..... 3
Twenty-four distinct varieties:
1st premium, Ellwanger & Barry, Rochester 5
2d do John Davis, Ithaca 3
Twelve varieties:
1st premium, Frost & Co., Rochester 3
2d do W. Brown Smith, Syracuse 1

Phloxes.

Greatest number, newest and best varieties:
1st premium, Ellwanger & Barry, Rochester 5
2d do W. Brown Smith, Syracuse..... 3
Twelve varieties:
1st premium, W. Brown Smith, Syracuse 3
New seedling, not before exhibited:
1st premium, Ellwanger & Barry, Rochester 1

Carnations.

Display, monthly carnations:
1st premium, Ellwanger & Barry, Rochester..... 3

Verbenas.

Greatest number of newest and best varieties:
1st premium, Ellwanger & Barry, Rochester 5
2d do John Davis, Ithaca 3
Twelve varieties:
1st premium, Ellwanger & Barry, Rochester 3
2d do J. Donelson & Co., Rochester..... 1
Collection, three varieties of American seedlings, not before exhibited:
1st premium, Ellwanger & Barry, Rochester $1

German Asters.

Collection:
1st premium, J. Donelson & Co., Rochester..... 3
2d do Ellwanger & Barry, Rochester 1

Pansies.

Collection:

1st premium, Wm. Brown Smith, Syracuse..... $3
2d do J. Donelson & Co., Rochester..... 1

Ten Week Stock.

1st premium, John Davis, Ithaca..... 3
2d do W. Brown Smith, Syracuse..... 1

No. 71. Class 2. Amateur List.

Cut Flowers.

Display:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 10
2d do James Vick, Rochester..... 5

Dahlias.

Greatest number, newest and best varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 6

Twelve dissimilar blooms:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 3
2d do Mrs. Henry Wier, do 1

Six dissimilar blooms:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 2
2d do Mrs. Henry Wier, do 1

Roses.

Greatest number of newest and best varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 6

Twelve varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown 3

Six varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 2

Carnations.

Display, monthly carnations:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 3

Verbenas.

Greatest number of newest and best varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 5
2d do John Charltin, gardener for J. Hall, Brighton..... 3

Twelve distinct varieties:

1st premium, Mrs. H. Lamb, Fulton..... 3
2d do Mrs. J. T. Van Namee, Pittstown..... 1

Six varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 2

Seedling, not before exhibited:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 1

Phloxes.

Greatest number of newest and best varieties:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 5

Six varieties, with name:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 2

Seedling, not before shown:

1st premium, Mrs. J. T. Van Namee, Pittstown..... 1

German Asters.

Collection:

1st premium, James Vick, Rochester..... 3
2d do Mrs. J. T. Van Namee, Pittstown..... 1

Pansies.

Collection:
1st premium, Mrs. Henry Wier, Pittstown $3
2d do Mrs. H. Lamb, Fulton 1

Ten Week Stock.

Display:
1st premium, James Vick, Rochester 3
2d do Mrs. Henry Wier, Pittstown 1

No. 72. General List.

Pot Plants.

House plants, in pots, twenty different specimens
1st premium, Ellwanger & Barry, Rochester 10
2d do Frost & Co., Rochester 5

Floral Design or Ornament.

1st premium, Mrs. J. T. Van Namee, Pittstown 5
2d do H. C. Heath, gardener to D. W. Powers, Rochester 3

Bouquets.

Pair hand:
1st premium, Frost & Co., Rochester 5
2d do C. J. Ryan & Co., Rochester 3
Pair parlor:
1st premium, C. J. Ryan & Co., Rochester 5
2d do Ellwanger & Barry, Rochester 3
Basket bouquet:
1st premium, Mrs. J. T. Van Namee, Pittstown 5
Best display of newly introduced plants, Ellwanger & Barry, Rochester 5
J. M. Mattison, Jacksonville, special, for collection of dahlias, phloxes, and parlor bouquet, &c 10

No. 73. Class 1. Professional List.

Apples.

Forty varieties:
1st premium, W. Brown Smith, Syracuse 15
2d do Ellwanger & Barry, Rochester 10
Twenty varieties:
1st premium, H. E. Hooker & Co., Rochester 10
2d do E. W. Sylvester, Lyons 5
Twelve varieties:
1st premium, A. Bramin, Ithaca 5
2d do J. Donelson & Co., Rochester 3

Pears.

Twenty varieties:
1st premium, Ellwanger & Barry, Rochester 15
2d do H. E. Hooker & Co., do 10
Fifteen varieties:
1st premium, C. J. Ryan & Co., Rochester 10
2d do W. Brown Smith, Syracuse 5
Ten varieties:
1st premium, W. Brown Smith, Syracuse 8
2d do James M. Mattison, Jacksonville 4
Six varieties:
1st premium, W. Brown Smith, Syracuse 5
2d do James M. Mattison, Jacksonville 3

Peaches.

Twelve varieties:
1st premium, J. Donelson & Co., Rochester.. ..... $5
2d do C. J. Ryan & Co., do 3
Six varieties:
1st premium, C. J. Ryan & Co., Rochester..... 4
2d do J. Donelson & Co., Rochester..... 2
One variety, twelve specimens:
1st premium, J. Donelson & Co., Rochester..... 2

No. 74. PROFESSIONAL LIST.

Plums.

Twelve varieties:
1st premium, Ellwanger & Barry, Rochester 5
2d do W. Brown Smith, Syracuse. 3
Six varieties:
1st premium, W. Brown Smith, Syracuse 3
One variety:
1st premium, W. Brown Smith, Syracuse..... 2

Quinces.

Dozen apple or orange:
1st premium, Ellwanger & Barry, Rochester 3
2d do W. Brown Smith, Syracuse..... 2

Grapes.

Greatest number of good Native varieties:
1st premium, Pleasant Valley Wine Co., Hammondsport..... 5
2d do C. L. Hoag, Lockport..... 3
One variety:
1st premium, Pleasant Valley Wine Co., Hammondsport..... 2
Greatest number of varieties, and best specimen of Foreign grapes, grown under glass:
1st premium, Ellwanger & Barry, Rochester..... 6
One variety:
1st premium, Ellwanger & Barry, Rochester..... 2
2d do Pleasant Valley Wine Co..... 1

Muskmelons.

Greatest number of varieties:
1st premium, J. Donelson & Co., Rochester..... 5
Specimen:
1st premium, J. Donelson & Co., Rochester..... 1

Discretionary.

Best single variety of Apples, "King of Tompkins co.," E. C. Frost, Highland Nurseries, Havana.....Downing.
Seedling Grape, "Carpenter's Mottled," A. Y. Baker, Hammond Depot.....Thomas.
Adirondack Grape, superior seedling, John W. Bailey, Plattsburgh, Downing.

ADIRONDACK GRAPE.—REPORT OF COMMITTEE AT ROCHESTER.

Before closing their labors, the undersigned would call attention to a new native grape, named the *Adirondack*, and exhibited by John W. Bailey, of Plattsburgh.

Accepting Mr. Bailey's statement, that the Adirondack ripens two weeks earlier than the Delaware, we think it presents claims to the favorable

notice of fruit growers in the northern States and the Canadas. In color, it resembles the Isabella, but is somewhat larger. In quality, it is sweet and pleasant, with little or no hardness of pulp. Those who prefer an earlier grape than the Delaware will welcome the Adirondack. The undersigned cheerfully indorse the opinion of the American Pomological Society, that "the Adirondack promises excellently well."

CHARLES DOWNING,
EDWARD NORTH,
A. H. McLEAN,
DE WITT C. DE FOREST.

ROCHESTER, *Oct.* 2, 1862.

No. 75. CLASS 2. AMATEUR LIST

Apples.

Twenty varieties:
1st premium, R. C. Brown, Rochester..... $12
2d do D. C. Hillerman, Watkins..... 8
Fifteen varieties:
1st premium, A. Wilder, Charlotte..... 10
2d do R. C. Brown, Rochester..... 5
Ten varieties:
1st premium, John Charlton, gardener for Joseph Hall, East Brighton. 5
2d do R. C. Brown, Rochester..... 3

Pears.

Fifteen varieties:
1st premium, Mrs. Edward Dagge, Rochester..... 12
2d do James Craib, gardener for Joseph Harris, Brighton..... 8
Ten varieties:
1st premium, J. S. Clark, Greece..... 10
2d do John Charlton, gardener for Joseph Hall, East Brighton. 5
Six varieties:
1st premium, Philander Bennett, Rochester..... 8
2d do F. W. Little, do 4

Peaches.

Six varieties:
1st premium, P. Odell, Wolcott..... 4
One variety:
1st premium, J. S. Clark, Greece..... 2

No. 76. AMATEUR LIST.

Plums.

Six varieties:
1st premium, H. C. Heath, gardener to D. W. Powers, Rochester..... 3
One variety:
1st premium, G. W. Lawrence, Oswego..... 2

Quinces.

Dozen Apple or Orange:
1st premium, H. G. Warner, Rochester..... 3
2d do C. H. Heath, gardener for D. W. Powers, Rochester..... 2

Grapes.

Greatest number of good Native varieties:
1st premium, A. S. Moss, Fredonia..... 5
2d do James Craib, gardener to Joseph Harris, Brighton..... 3

One variety:
1st premium, James Craib, gardener to Joseph Harris, Brighton..... $2
Greatest number of varieties, and best specimen of Foreign Grapes, grown under glass:
1st premium, P. W. Fobes, Syracuse..... 6
2d do James Craib, gardener to J. Harris, Rochester..... 3
One variety:
1st premium, Gideon Granger, Canandaigua..... 3
2d do do do 1
Specimen:
1st premium, Albert Breed, Ridgeway..... 1

Muskmelons.

Specimen:
1st premium, Norman Culver, Newark..... 1

Twenty-second Annual Fair.

The twenty-second annual exhibition of the Society, which has just closed, has been among the most successful exhibitions held by the Society. In the midst of the conflict which is now carried on in our country for sustaining our government, and which has called from our fields and workshops more than 100,000 men, it was most gratifying to witness an exhibition from our farmers and mechanics which, in several departments, has never been excelled. The weather, though unfavorable for most of the days of the fair, did not deter the enterprising population of western New York from being present in great numbers, thus testifying their attachment to our State Agricultural Society, and commending the efforts which were made for the advancement of our great agricultural interest, one of the most important in our land, under circumstances the most discouraging. Only four of the preceding annual exhibitions of the Society have given receipts exceeding those at Rochester in 1862—a fact which shows the peculiar advantages of this locality not only, but also the deep interest which the farmers of the western part of our State take in sustaining the Society.

The reports from the various committees will show how well the main departments were represented. The sheep department was of an excellence never before reached by the Society in any former exhibition. The horse department showed the great improvement which has been made in our State—a display seldom equaled in the country. The cattle were not as numerous as at some former exhibitions, yet when the prize animals were displayed in the ring, it was admitted by all that few exhibitions had excelled this in the quality of stock on exhibition. The swine, though not as large as at Watertown last year, were of great excellence.

The machinery and implement department shows a very great improvement, worthy of the mechanics of our State.

Fruit was, as expected, far superior to any previous exhibition, and the crowds who visited floral hall, prepared most admirably for the display of fruits and flowers by James Vick, Esq., who had the entire charge of the whole arrangement, responded to the great excellence of this exhibition, which we believe has never been excelled in our State.

The vegetable, grain and dairy department was not well sustained. The

first, from the want of interest in the subject—because the vicinity of Rochester alone could have made it all that was desired—the latter, because the demand for our butter abroad had induced our dairymen to sell their entire dairies. In some instances we were advised by butter men that this was the reason they did not show.

The grounds, under the direction of B. M. Baker, President of the Monroe County Agricultural Society, were arranged to the satisfaction of the executive committee.

The general superintendent, John Harold, Esq., of Queens county, carried out all the details upon the grounds to the satisfaction of the public; and the police magistrate, E. S. Hayward, of Brighton, satisfied those who violated the regulations of the Society, that they had fallen into the hands of a magistrate who was determined to protect the farmers from their intrusions. Receipts, $11,263.55.

The State Fair.—A Card from the Executive Committee of the State Agricultural Society.

The executive committee of the New York State Agricultural Society desire to acknowledge their obligations to the mayor and common council of the city of Rochester for their cordial co-operation with the officers of the Society in every effort put forward to secure success to the twenty-second annual exhibition, which, in many respects, has been one of the most satisfactory ever given by the Society. The thanks of the committee are also due to the city authorities for the free use of the city hall, in which to hold the meetings for discussion, and the generous and hospitable entertainment provided for and extended to the committee.

The citizens of Rochester are entitled to great praise for the kindness and attention manifested by them, and their cordial and hospitable reception and entertainment of the many strangers who visited their beautiful city during the week.

The press of the city of Rochester, with the liberality characteristic of the profession, and a proper appreciation of the incalculable advantages accruing to the agricultural interests of the State by the existence and proper support of the State Society, rendered most valuable aid to the committee, and will accept their hearty acknowledgments.

The farmers and citizens of Monroe county and its vicinity, as well as the farmers throughout the State, evinced their deep interest in the welfare and maintenance of the Society by their liberal contributions to the exhibition, and their personal attendance. They have shown that, although the public mind is absorbed in the exciting events of the day and the hour, the people of the Empire State deem it a duty to foster and encourage every effort tending to develop the resources and agricultural wealth within its borders.

For the unequaled attractiveness and beauty of floral hall, the committee, and the thousands who gazed in admiration upon the almost endless varieties of fruits and flowers of every name and nature, color and hue, are greatly indebted to James Vick, Esq., the superintendent of that department, by whom it was designed and arranged. Never before has such a

collection of mother earth's luxuries, delicacies and beauties been gathered together in this State, or in the Union. The fruit growers and florists who contributed to the exhibition are amply rewarded in the knowledge that it has never been equaled, and challenges successful competition.

The citizens of Canada gave additional proof of their interest in the Society and its annual exhibitions, by attending in considerable numbers, and adding to the attractions of the various departments by valuable contributions.

The committee feel a pleasure in rendering an especial acknowledgment to D. D. T. Moore, Esq., of the *Rural New Yorker*, and superintendent of the press, for the highly satisfactory manner in which he performed his duties, and his universal exertions to insure that success which has so happily resulted.

The thanks of the committee not only, but also of the exhibitors and visitors, are due and cordially tendered to general superintendent John Harold, Esq., for the diligent and faithful discharge of his highly responsible and laborious duties. The officers of the Society best understand the extent and importance of his services, and they do not hesitate to award him the highest meed of praise for his strict and careful attention to the interests of the Society and its patrons. The assistant superintendents in the various departments are also deserving of praise for their promptness in carrying out the orders of the superintendent, and their watchful care over the property entrusted to their keeping.

The committee also desire to thank Capt. John Brennan, superintendent of police, and his officers, for the diligence and energy displayed by them.

The executive committee discharge a pleasant duty in expressing their obligations to B. M. Baker, Esq., President of the Monroe County Agricultural Society, and chairman of the local committee, and also to the members of the committee, for their untiring exertions in behalf of the Society, and for the prompt and efficient manner in which they discharged all the arduous duties devolving upon them.

The officers of the different railroad corporations will accept the acknowledgments of the committee for their generous liberality in transporting articles to and from the fair free of charge, a service of the highest importance to the Society not only, but to every exhibitor.

On behalf of the executive committee,

ROCHESTER, *Oct.* 4, 1862. B. P. JOHNSON, *Secretary.*

AGRICULTURAL DISCUSSIONS.

The discussions each evening during the fair were well sustained, and were of great interest. The valuable information obtained at these meetings attracts large numbers of farmers, who return to their homes to put in practice what they have learned as best adapted to their locality. We found while abroad that these discussions, as published in our Transactions, had attracted the notice of gentlemen to whom they had been furnished, as being of great practical utility and worthy of notice.

We desire to tender to the gentlemen who donated to us choice fruits for one, very dear to us, now an invalid, our most grateful thanks, and assure them that they will be most gratefully remembered for all time to come.

We give the proceedings of the executive committee on closing up their labors at Rochester.

Card of Thanks.

The ladies of the 3d Ward Volunteers' Aid Society desire to return their grateful acknowledgments to the officers of the New York State Agricultural Society, and to Mr. B. M. Baker, chairman of the local committee, for giving them permission to erect a tent on the fair grounds; to Mr. Harmon Taylor, who, having purchased the exclusive right of selling refreshments on the grounds, generously allowed them to sell the same, during the continuance of the State Fair; to the ladies of the 3d ward, and their country friends, for a most ready and cheerful response to their call for supplies; to Mr. Wadsworth and Mr. Lucas, for their liberal donation; and to all who kindly patronized them, or assisted, by giving their time, services or money.

Rochester, *Oct.* 4, 1862. CAROLINE MANN, *Secretary.*

Testimonial to the Secretary.

The clerks who have been employed in the business office of our State Fairs for several years, and who have discharged the arduous and perplexing duties greatly to the satisfaction of exhibitors and the Society, called at the rooms of the Secretary on Friday evening, after the fair was closed, and after a cordial greeting, J. B. Cushman, Esq., on their behalf, presented an elegantly cushioned arm chair, which they desired the Secretary to accept. Mr. Cushman addressed the Secretary as follows:

"Col. Johnson—In behalf of the clerks who have for so many years been connected with you during these annual gatherings, I have the pleasure of presenting to you this testimonial as a feeble expression of the regard and attachments formed by our associations upon these occasions.

"As you recline in it during your remaining years, we trust it will afford you the same degree of pleasure that is realized by those whom I represent upon this occasion; and allow me to express the hope that you may be spared many years to fill the position which you now occupy in the most important institution of our State."

The Secretary replied:

"That wholly unexpected as the object of the interview was, as that was the first testimony of the kind which had ever been tendered to him, he would cheerfully accept it; and as it could not be anticipated that they might be permitted for many years to meet under his supervision in the service of this Society, one of the noblest of our land, he most cordially desired that the best of Heaven's blessings might rest upon each of those who had contributed to this present, and when their work on earth should be closed, that all might be permitted to meet in that better world where the toils of earth will be forgotten."

We desire to express our thanks to those gentlemen who, at so much sacrifice, have for years assisted us in the perplexing duties of the State Fairs. Few are aware of the amount of labor required in the business office, to arrange the entries and prepare the books for one of our fairs. Days and nights of unwearied labor are required to do this business. It

has been a very great gratification to us, to have had gentlemen so well calculated for those duties; and for years we have labored together without a single occurrence, to our knowledge, to mar the good feeling which should ever be desired in such associations. Whatever position it may be our lot to occupy hereafter, we most cordially recommend these gentlemen as worthy of the most implicit confidence, and competent to discharge any duties where intelligence, integrity and fidelity to trust, are requisite.

B. P. JOHNSON.

Premiums Awarded at Annual Meeting.

Thursday Evening, *February* 12.

The Society met at the lecture room in the State Agricultural Hall shortly after 7 o'clock. President Cornell in the chair. His Excellency Gov. Seymour, being present, was invited to a seat on the platform.

The Secretary, Col. Johnson, then read the report of committees on articles competing at the exhibition, showing the following premiums awarded:

Best collection of winter pears, Ellwanger & Barry, Rochester, Dip. & S.M.
Best variety of winter pears, (Easter Beurre,) H. G. Warner, Rochester,..... S. S. Med.

Apples.

Best 20 varities, W. H. Slingerland, Bethlehem..... $3
2d best 20 varieties, H. Pine, Pittstown..... 2
Best 15 varieties, George Cary, Bethlehem..... 3
Best dish of apples, (Newtown Pippin,) George Cary..... S. S. Med.
2d best dish of apples, (Esopus Spitzenberg,) J. O. Sheldon, Geneva, Trans.

Grain and Seeds.

1st premium, winter wheat, E. S. Hayward, Brighton, (Soule's wheat,) $3
2d. H. Pine, (red wheat,)..... 2
1st premium, spring wheat, H. Pine..... 3
1st premium, rye, H. Pine..... 3
2d. A. E. Van Allen, De Friestville..... 2
3d. H. Schoonmaker, Cedar Hill..... 1
1st premium, barley, E. S. Hayward..... 3
2d. H. Wier, Johnsonville..... 2
1st premium, oats, H. Wier..... 3
1st premium, yellow corn, E. S. Hayward..... 3
2d. H. Schoonmaker..... 2
3d. H. Pine, Lansinburgh..... 1
1st premium, white corn, H. Wier..... 3
2d. A. E. Van Allen..... 2
3d. H. Wier..... 1
1st premium, peas, H. Wier..... 3
1st premium, beans, H. Pine..... 3
2d. L. L. French, Warren..... 2
3d. A. E. Van Allen..... 1
1st premium, flax seed, H. Wier..... 3
1st premium, buckwheat, H. Schoonmaker..... 3
2d. H. Wier..... 2

A very fine specimen of ears of corn was exhibited by George Benedict, of Verona, Oneida county.

Twenty varieties of corn in the ear were shown by D. A. Bulkeley, of Williamstown, Mass. Trans.

The committee recommended an honorable mention for a sample of California peach blow potatoes, exhibited by H. Schoonmaker, Cedar Hill, Albany county.

D. A. Bulkeley, Williamstown, Mass., had on exhibition samples of his very excellent seedling potates, the Prince of Wales and Monitors; also a very fine sample of maple sugar, made by Mr. Bulkeley, the last week in January, 1863. Diploma.

Henry Wier, Johnsonville, Rensselaer county, exhibited a very fine sample of millet seed. There being no premium offered, the committee recommended honorable mention to the exhibitors—vol. of Trans. to each.

Butter.

3 tubs butter, made in June, August and November, H. Pine, 2d premium $10
1st premium winter butter, L. L. French, Warren..... 5
2d. Mrs. H. Wier, Johnsonville..... 3

Cheese.

1st premium, E. F. Carter, Evans' Mills..... 15

Crops.

Your committee on field crops have examined the rules and regulations with regard to the statements and affidavits required by the Society from competitors. In this class we find there have been but two entries made, being those of O. W. Blair, of Verona, Oneida county, for an acre of corn, 92 bushels, and 37½ rods of land, producing 89 bushels of potatoes; both of which entries, with the accompanying statements, do not, in any respect, comply with the requirements of the Society; therefore, we cannot award any prizes in this class, but would recommend a discretionary premium to the exhibitors—vol. Trans. and Thomas' Fruit Culture.

W. H. SLINGERLAND,
JAMES S. McDONALD.

Implements and Discretionary.

The committee on implements and unenumerated articles beg leave respectfully to report, that they examined the few articles presented to them, as well as they were able; but, being fully convinced that the only true test of an implement is by actual experiment, they hesitate to do more than mention the various objects they examined, with some few words of description.

A wool press, entered by James Geddes, was, however, so simple and evidently useful an implement, and new withal, that they do not fear to recommend it, and to express their opinion that it is well fitted to facilitate the labor of tying fleeces, and with a little care would enable the operator to make all his fleeces of uniform size and form. Its simplicity, cheapness and durability commend it to every flock master.

The ditching plow, exhibited by S. Walrath, of Gouverneur, St. Lawrence county, is said to make very good work with a small expenditure of power, and at a low cost. Those who have used them speak well of the implement.

J. Fink's "Union Climax Cultivator" appears to be an excellent machine, almost protean in its forms, and nevertheless simple in its construction.

It is entirely of iron, except the handles, and is yet neither cumbrous nor heavy, and exemplifies the advantage of substituting iron for wood in our agricultural implements. Its very appearance recommends it; and if its performance at all corresponds with its promise, it must be a valuable implement.

Mr. Chichester exhibited a changeable plow and potato digger, of a novel construction, which is said to do good work.

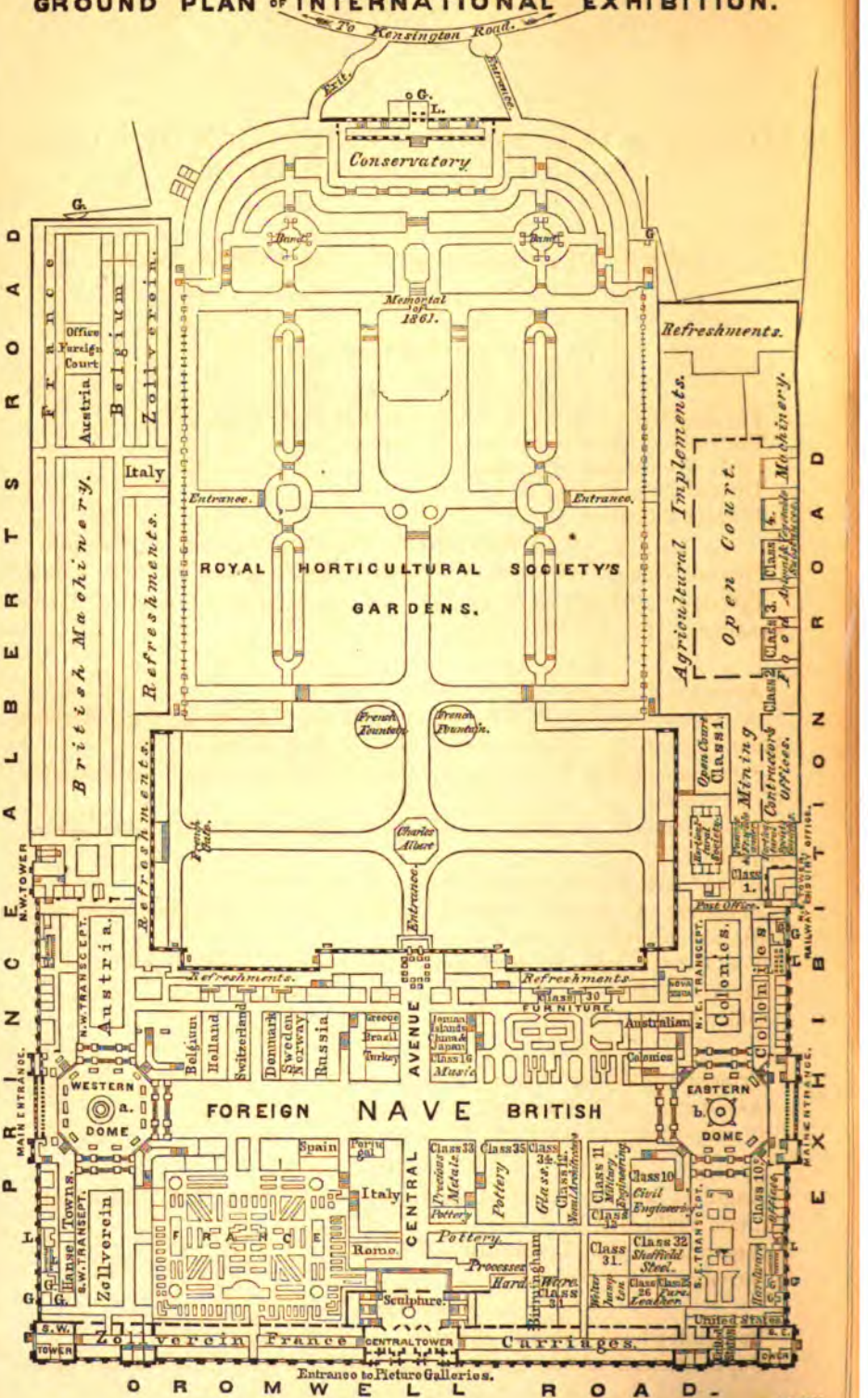
A hay fork, by J. J. Van Allen, Greenville, Greene county, N. Y., presented a novel arrangement of the catch for relieving the fork of its load.

Palmer's horse hay-fork was on exhibition; having received the first premium at Rochester, the committee do not feel called upon to discuss its merits.

A farmer's bee-hive, exhibited by J. Hazen, Albany, combines some new features in a simple form, and seems to be well calculated for the purpose intended.

FRANCIS M. ROTCH,
EDWIN THORNE,
THOMAS S. STRONG.

GROUND PLAN OF INTERNATIONAL EXHIBITION.



LONDON INTERNATIONAL EXHIBITION OF WORKS OF INDUSTRY AND ART, 1862.

REPORT OF B. P. JOHNSON, U. S. COMMISSIONER.

Official Directory.

HER MAJESTY'S COMMISSIONERS.

The Earl Granville, K. G., *Lord President of the Council.*
The Duke of Buckingham and Chandos.
Sir C. Wentworth Dilke, Bart
Thomas Baring, Esq., M. P.
Thomas Fairbairn, Esq.
F. R. SANDFORD, *Secretary and General Manager.*
Special Commissioner for Jury Department, Dr. Lyon Playfair, C. B., F. R. S.

Offices of Her Majesty's Commissioners:—Exhibition Building, South Kensington, London, W.

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Clerks—Percy Jackson, W. G. Lawrence.

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Superintendent of Decoration—J. G. Grace.

Surveyor—H. F. Gritten.

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Superintendent of British Division—A. N. Sherson.

Superintendent of Foreign Department—P. C. Owen. Assistants—Lieut.

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Superintendent of Colonial Department—Dr. Lindley, F. R. S.

Deputy Superintendent—P. L. Simmonds, F. S. S.

Superintendent of Indian Department—Dr. Forbes Watson.

Superintendent of Fire Arrangements—Captain Bent.

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2, 3, 4—C. W. Quin, F. C. S. Assistant—F. E. Thomas. Clerk—H. A. Kinloch.

5, 7, 8, 10—D. K. Clark. Assistants—Nat. Grew, C. E., John Cundy, C. E., Rob. Harwood, Edwin S. Rose. Clerk—W. Green.

6, 31, 32, 36—T. A. Wright. Assistants—J. Boult, F. A. Rainbow.

11, 12—Major Moffatt.

13, 25, 26—C. R. Weld. Assistant—W. Hensman Jordan.

14—P. Le Neve Foster, M. A. Assistant—C. A. O. Baumgartner.

15, 28, 38A—J. Leighton, F. S. A. Assistant—R. Pigot.

16—C. Boosé.

17—J. R. Traer, F. R. C. S.

18, 19, 20, 21, 22, 23, 24, 27—G. Wallis. Assistants—J. Taylor, E. J. Albo, J. Lidford.

29—J. G. Fitch, M. A. Assistant—C. A. O. Baumgartner.

30, 33, 34, 35, 37—J. B. Waring, F. R. I. B. A. Assistants—J. C. Gapper, G. A. Stewart.

39—Edmund Oldfield, M. A.

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Surveyor-General—F. S. John.

Examining Officer—W. G. Bramall. Assistant—G. H. Scrivenor.

Clerk and Assistant—F. Cockburn.

Out-door Officers—A. Cobb, C. Buchanan, J. Atkinson.

Messenger—W. Thomas.

ACTING COLONIAL COMMISSIONERS.

Canada.—Sir W. E. Logan, Brown Chamberlin, and J. B. Hurlbert.

Vancouver.—The Hon. A. J. Langley.

British Columbia.—Richard Charles Mayne, R. N.

New Brunswick.—Thos. Daniel.

Nova Scotia.—Andrew M. Uniacke.

Prince Edward's Island.—H. Haszard, 25 Old Basinghall street.

Newfoundland.—F. N. Gisborne.

Bermuda.—W. C. Fahie Tucker.

WEST INDIAN COLONIES, &C.

Bahamas.—Samuel Harris.

Barbados.—Stephen Cave, M. P.

British Guiana.—Sir Wm. H. Holmes, and A. F. Ridgway.
Jamaica.—Edward Chitty, Lucas Barret, and Alex. F. Ridgway.
St. Vincent.—George C. Stackpoole, M. D.
Trinidad.—Sir W. H. Holmes.

AFRICAN COLONIES AND COUNTRIES.

Natal.—W. C. Sargeaunt.
St. Helena.—N. Solomon.
Liberia.—Gerard Ralston.

AUSTRALASIAN COLONIES.

New South Wales.—Edward Hamilton, Sir Daniel Cooper, and Sedgwick Cooper.
Queensland.—Mr. H. Marsh, Alfred Denison, and Arthur Hodgson.
Victoria.—C. E. Bright.
South Australia.—Francis S. Dutton.
Western Australia.—Alex. Andrews.
Tasmania.—Joseph Milligan, M. D.
New Zealand.—John Morrison.

EASTERN COLONIES.

Ceylon.—E. Rawdon Power.
Mauritius.—James Morris.

Acting Foreign Commissioners.

Belgium.—O. Delepierre, Secretary of Legation and Consul, 3 Howley Place, Maida Hill; and M. C. de Grelle, 28 St. Stephen's Square, Westbourne Park.
Denmark.—A. Westenholz, Consul-General, 26 Mark Lane.
France.—M. Le Play, Conseiller d'Etat; and M. Roguès, Hôtel de la Commission Impérial, Cromwell Road.
Austria.—Chevalier De Schwarz, 6 Onslow Crescent, Brompton.
Prussia.—Geheimer Ober Reigerungs-Rath Hoene; A. Altgelt; and C. Heidman, 10 Hereford Square, Brompton.
Baden.—Dr. Dietz, 40 Brompton Square, S. W.
Bavaria.—Dr. C. Beeg, 48 Brompton Square, S. W.
Frankfort.—P. F. Gouda, 58 Watling street, Cheapside, E. C.
Hanover.—Dr. C. Karmarsch, 9 Sussex Place, South Kensington, W.; and G. W. Roese, 8 Trafalgar Square, Brompton.
Saxony.—Regierungs-Rath M. L. Wiessner, 13 Alfred Place, W.
Wurtemberg.—Dr. von Steinbeis, 53 Brompton Square, S. W.
Hamburg.—G. J. Göschen, 12 Austin Friars, E. C.
Hanse Towns.—A. L. J. Meier, 26 Gloucester Grove, Old Brompton, W.
Greece.—A. C. Ionides, Consul-General, 17 Grace Church street, City.
Ionian Islands.—H. Drummond Wolff, C. M. G., London.
Italy.—H. Grabau, 44 Thurloe Square; and A. Gabrielli, 6 Queen's Gate Terrace.
Netherlands.—Baron van Brienen van Groetelindt; and J. W. Campo, 3 Trevor Terrace, Knightsbridge.
Norway.—E. Tidemand, 7 South street, Thurloe Square.
Sweden.—C. F. Waern, 66 Sussex Lodge, Addison Road, South Kensington.

Portugal.—Le Viscount de Villa Maior, 91 Sloane street, S. W.
Rome.—H. Doyle, 17 Cambridge Terrace.
Russia.—Gabriel de Kamensky, 33 Victoria Road, Kensington Gore.
Spain.—G. Esteban Balleras, 23 Philpot Lane, E. C.
Switzerland.—G. Vogt; and F. Fuchser, 1 Ovington Terrace, Brompton.
Turkey.—P. Gadban, 7 Lothbury.
United States.—Col. B. P. Johnson, 23 Sumner Place; J. E. Holmes.
Costa Rica.—G. W. Ewen, 4 Adam Court, Old Broad street, E. C.
Brazil.—F. I. de Carvalho Moriera, Brazilian Minister; Agent, W. H Clark, 6 Leinster Terrace, Hyde Park.
Peru.—H. Kendall, Consul, 11 New Broad street, E. C.
Uruguay.—G. Gilmour, Vice-Consul, Glasgow.

Letter from Her Majesty's Commissioners.

The Earl Granville, K. G., *Chairman.* The Duke of Buckingham and Chandos. Sir C. Wentworth Dilke, Bart. Thos. Baring, Esq., M. P. Thos. Fairbairn, Esq. F. R. Sandford, *Secretary.*

To the Commissioner for the United States:

Dear Sir: Although the concluding ceremony of the International Exhibition will not, as you have already been informed, take place till the month of January next, I cannot allow the day on which the building is virtually closed to the public to pass away without congratulating you in my own name, and on behalf of my colleagues, on the results that have attended the labors of your commission, to the several members of which we beg to offer our cordial thanks for the invaluable assistance which they have rendered to us in carrying this great undertaking to a successful issue.

We received in the first instance, with much satisfaction, the announcement of your nomination by your government to represent the interests of your country, and now at the close of the exhibition we cannot express too warmly our gratitude for the manner in which, while legally maintaining these interests, your commission has supported us in our endeavors to promote the general efficiency and success of the exhibition.

We have, moreover, much pleasure in thinking that in no single instance, from the time when we first entered into communication with you, has any misunderstanding arisen to interrupt the general harmony that has prevailed throughout the exhibition.

While we feel that we are much indebted for this happy result to the cordial coöperation of yourself and your colleagues, we are also sensible that no small share of thanks is due to the executive and officers of your commission, to whom we would therefore request you to tender our warmest acknowledgments.

We have also to request that you will have the goodness to communicate the substance of this letter to the various members of your commission, and to your government; and begging you to accept personally an expression of our very high esteem,

I am, my dear sir, yours very faithfully,

GRANVILLE.

ALBANY, U. S., *November* 20, 1862.

To Earl Granville, K. G., Chairman of Her Majesty's Commissioners:

Dear Sir: I am favored with your letter to the Commissioner of the United States at the closing of the building, and I cannot let this opportunity pass without expressing my most grateful thanks to Her Majesty's Commissioners for the very kind expressions of approbation of the United States department and its management during the exhibition.

We are under the deepest obligations to Her Majesty's Commissioners for the facilities extended to us, and it gives me great pleasure to assure you that everything desired by our department has been afforded us, and that in a manner the most gratifying. I beg leave to tender to yourself, and to Her Majesty's Commissioners, my personal acknowledgments, which I desire you, on my behalf, to present to your associates.

With the highest regards,

I am, my dear sir, faithfully yours,

B. P. JOHNSON, *U. S. Commissioner.*

INTERNATIONAL EXHIBITION IN LONDON, 1862.

INTRODUCTION.

The subscriber, having been present at the exhibition in London as Commissioner from the United States, and also as the representative of this State and of the State Agricultural Society, prepared a report to the President of the United States, which was deposited in the post office in this city previous to the adjournment of Congress, but did not reach Washington, and no information in regard to it has been obtained. As the exhibitors from this State comprised a large share of the exhibitors, it was deemed desirable that a report should be made, showing the character generally of the exhibition as compared with that of 1851, and also a description of the articles from this country which had found favor in this unequaled exhibition. Severe domestic afflictions limited the time which could be devoted to the preparation of the first report which was forwarded to Washington. The present report, which is not as complete, has been prepared, and it is hoped that its deficiencies will be overlooked, as the pressure of other duties has called for labors in another direction, which have occupied much of my time, and many of the documents in the report which has been lost cannot now be replaced. While in attendance at the exhibition, as much time as possible was devoted to a personal examination of the exhibition itself, and yet every day until the last developed some new beauty, or revealed some priceless work of taste and of art, which had not been before noticed. I have availed myself of the labors of others, where they aided my purpose of giving a proper description of the exhibition. To Mr. J. E. Holmes, the Assistant Commissioner, who secured the introduction into the exhibition of our articles, and who arranged and managed our department under the most serious obstacles, I am greatly indebted, and his compilation and description of our articles have been of the greatest advantage.

The reports of the jurors, as far as I have been able to examine them, have been very useful. The most important of these are given in an appen-

dix to this report. These will enable our people to form some faint idea of the immense exhibition which has been brought before the nations of the world—where, in the language of His Royal Highness Prince Albert, nations came to remedy the deficiencies apparent in the exhibition of 1851, and it is a matter of wonder that such improvements have been made in the various countries there represented. Although the United States had but a very limited representation there, it is a matter of just congratulation that our exhibitors received a larger proportion of prizes to the number of articles exhibited, as shown by the reports, than any other country, and we had on exhibition *more new and useful inventions*, it is believed, than any other country.

These men are entitled to the gratitude of their country for having, in the hour of her peril, without pecuniary aid from the government, presented themselves at this great exhibition and entered the lists with the nations of the world, and come off triumphant. Having been solicited by these exhibitors, many of them, to aid them in their laudable effort, I did what I could to sustain the standing secured in 1851; and I trust a careful perusal of this very imperfect report will satisfy every unprejudiced mind that our appearing in that exhibition has been the means of showing to the world the resources of our country, and the importance of our free institutions in developing the talents and capabilities of our citizens, which could not have been done in any other manner.

To Her Majesty's Royal Commissioners I am greatly indebted for the courtesy and kindness which were extended to myself and those associated with me, and to all our exhibitors. Every desired attention was given to us, and we were treated with the same attention as the most favored nations. We shall ever remember with gratitude the many favors received.

The letter from Earl Granville at the close of the exhibition shows the estimation in which our services were regarded by Her Majesty's Commissioners.

B. P. JOHNSON, *U. S. Commissioner.*

ALBANY, *February*, 1863.

INTERNATIONAL EXHIBITION, 1862.

This exhibition owed its origin, as did that of 1851, to His Royal Highness Prince Albert and the Society of Arts, and it was a matter of deep regret that this distinguished individual was not spared to witness the success of this exhibition, so creditable to those engaged in its inception.

An invitation from Her Majesty's Commissioners having been extended to this country, the subject, it is well known, was presented by the President to Congress at its session in 1861. A resolution was passed authorizing the President to take such measures as he might deem advisable to have this country represented, and an appropriation of $2,000 was made to defray the expenses of preparing for the representation at the exhibition.

The President appointed as commissioners Hon. William H. Seward, Secretary of State; Caleb B. Smith, Secretary of the Interior; Edward Everett, Robert B. Minturn, Joseph Henry, J. H. Klippart, J. R. Partridge, G. D. Coleman, B. P. Johnson, R. Wallach, W. W. Seaton, Eli Whitney and J. C. G. Kennedy, who met October 15th, 1861, and organized by appointing Hon. William H. Seward, Chairman, and J. C. G. Kennedy, Secretary.

An executive committee was appointed, consisting of B. P. Johnson, Chairman; J. R. Partridge, Secretary; J. C. G. Kennedy, Prof. Joseph Henry and W. W. Seaton.

The executive committee opened an office at Washington, and made all necessary preparations to secure a representation from this country. Applications for space in the exhibition were received from seventeen States and the District of Columbia, and entries were made in twenty-eight of the classes (out of 36) into which the exhibition was divided. The articles entered and approved, had they all been present, would have fairly represented the great industrial interests of our country, and would have shown as much progress as in any other country which was represented in that exhibition. This was apparent to those Americans present at the exhibition, and who were familiar with the articles examined and approved.

The proceedings of the executive committee were reported to the President and approved by him, and were transmitted to Congress December, 1861; and the message was referred to the committee of ways and means in the House of Representatives. This committee reported, recommending an appropriation of $35,000 to defray the expenses of exhibitors and the necessary expenses to be incurred in London after the articles should be received. This appropriation failed in the House, as did one subsequently in the Senate for a like amount.

Most of those who entered articles declined to send them to the exhibition. A portion of the exhibitors, most of whose articles had been sent to the agency of the commissioners in New York, decided to go. The number of exhibitors whose entries were made before the exhibition opened, was ninety-five, and who were represented in the exhibition. Mr. Joseph E. Holmes, the agent of the commissioners at New York, who had received an appointment as agent for a large portion of those who had entered their

articles, decided to go to the exhibition, and was furnished with credentials to the Royal Commissioners, requesting them to permit our exhibitors to enter their articles, and to allow Mr. Holmes to take charge of them, as the Assistant Commissioner from the United States. In my letter to the Royal Commissioners, I advised them that I should be in London at an early day to take charge of the articles from the United States.

The permission to enter the articles was granted, and Mr. Holmes succeeded in having them properly arranged, and everything desirable was done to place them before the jurors. Mr. Holmes is entitled to the thanks of our citizens for his services; and to him our exhibitors are specially indebted for securing the display of our articles before such an assemblage as never before had been witnessed.

On my arrival I was most cordially welcomed by Her Majesty's Commissioners; and, as Commissioner representing the United States, received the attention due to the representative of our country, and every facility was given to our exhibitors, who were placed on an equal footing with the most favored nations—the commissioners expressing their regret that our nation was not more fully represented. There were but ninety-five exhibitors from this country whose articles were entered in time to be passed upon by the jurors; and of these, eighty-three were awarded prizes, as appears from the reports of the jurors—a larger proportionate number than was given to any other nation. In the single department of machinery, which was admitted by all as the best and most important department in the whole exhibition, and which decidedly showed more advance than any other since 1851, and in which England was eminently successful, this country had twenty-eight exhibitors, every one of whom was awarded a prize—no other nation having anything like such a testimonial. In agricultural implements, where there was great competition, we had but a limited number of implements, but *every one was awarded a prize.* It was most gratifying to be assured by those whom we met there, who were with us in 1851 as representatives of other governments, of their great regret that we were not fully represented, as in many instances they had been desired to secure for their governments or distinguished individuals samples of our implements and machinery. And when I showed to these gentlemen the list of entries which had been made at Washington, and told them that most of the articles entered would have been there had Congress appropriated $35,000 to cover the expenses, they expressed still greater regret that these articles, many of which were those desired by them, had not been present.

And here it may not be improper to say, that had Congress been fully aware of the importance of the exhibition to our country in the present state of our affairs, this small appropriation, as we have been advised, would have been cheerfully granted.

One most important fact, showing the value of our country being represented in 1851, was the improvements which were manifest in the machinery and implements on exhibition by other nations, as compared with those of 1851. In very many instances it was evident that the improvements arose from an adaptation of what had been made manifest as important and useful improvements in the implements and machinery from this country.

We found machines on exhibition from the continent, and to which prizes were awarded for their superiority, copied entirely from American machines which had been purchased in this country, and *exhibited* as the invention of another country.

Advance of the Exhibition over that of 1851.

Prepared as I was to see the advance the world had made in eleven years to be very great indeed, I was utterly amazed at the progress which had been made in many departments. The exhibition of 1851 had proved, as its distinguished originator, His Royal Highness Prince Albert, had said, "a school for nations;" each learned in that exhibition where they excelled—and where they were deficient. In 1862, the deficiencies of each nation were endeavored to be made up; and in that direction, I think, it is but just to England to say, that here more improvements have been made than in any other nation. The improvements in articles of utility, in articles of taste, have been most marked and wonderful; and several of the continental nations found, in the exhibition of 1862, that their laurels had been taken from them, and henceforth were to be worn by the inhabitants of this little sea-girt isle—certainly until another contest should take place.

In articles of utility, simplicity and cheapness—in new inventions—of articles in these directions, it was I think admitted, by attentive and careful observers, that we had more such than any other nation. The improvements in other countries were more generally confined to alterations of existing implements, machinery and fabrics.

In the great department of machinery, the jurors say: "In conclusion of these general explanations and remarks, it may be stated that, when the machinery of the present exhibition is compared with that of 1851, it is found to be marked *less by originality of invention, or the introduction of new principles,* than by improvement in details, workmanship and material."

The jurors, on railway plant, including locomotive engines and carriages, say: "There is *undoubtedly little of novelty* to be remarked on, in the construction of the greater proportion of the large number of locomotive engines sent to the present exhibition, when compared with the locomotives in use, and exhibited in the year 1851."

Had we taken to the exhibition an engine made for the N. Y. Central Railroad, by McQueen, of Schenectady, which was offered to us by the Hon. Erastus Corning, President of the New York Central Railroad, and who was our firm and stedfast friend in Congress for an appropriation, we should have given the jurors opportunity to have said, there is *novelty* combined with utility in this engine, and we must have it. They would at least have said of it, here is an engine with a *comfortable shelter* from the wind and storm, and from the smoke and sparks, which the engineers of Great Britain would gladly thank the United States for sending there, to teach them that it is worth while sometimes to take advice from others.

I was pleased with one engine in the exhibition, the "Manchester," a splendid coal burning engine of great power, *which had a covering from the weather for the driver and stoker;* and in relation to this arrangement an English paper says: "American engines are never without this useful addition;

and it seems an unnecessary cruelty to expose men, whose duties are so important and laborious, to rain, snow and wind, from which they may be so easily protected without diminishing their efficiency."

The jurors on carriages, not connected with rail or tram roads, say, "that the carriages shown in the British gallery are, on the average, *much lighter* than formerly," *one-fourth*, as I have before stated. Of the American carriages exhibited by Brewster, of Broome street, New York, the jurors say: "America, which only contributes two very light carriages, has rapidly risen to a great producing country for carriages; its productions are of a type quite original and peculiar to the country; and in some points have attained a singular excellence, as regards lightness combined with comparative durability; their execution shows good ability on the part of the workmen."

And these light wagons were appreciated there. A distinguished gentleman, heir apparent to one of the kingdoms on the continent, and his sister, went with me to examine these two American carriages. He had seen in 1851, when quite a youth, the American carriages, which had been put in use in his own country after that exhibition. He explained the carriages to his sister, and inquired of me their price; and when advised, asked if they were for sale. I informed him that they were sold. He regretted this very much, as he intended to have purchased one of them.

Since I left London I have heard that Mr. Brewster received orders for quite a number of his wagons.

I might extend extracts similar to these from other reports, but these confirm the impression made upon my own mind by a careful examination of the machinery, implements, &c., on exhibition. It may be well briefly to allude to the building itself, and the principles which were adopted for the examination of the articles by the juries.

The Building of 1862.

The building erected was of a substantial character, walls of the main building being of brick, and, though not as attractive as the Crystal Palace of 1851, was better calculated to display the articles to advantage. The site on which it was erected adjoins the Royal Horticultural Gardens, Kensington, and but a short distance from Hyde Park and the site of the Crystal Palace of 1851.

Capt. Fowke, of the Royal Engineers, was the designer of the present erections. This building was contrived with more regard to ulterior uses; and a departure from the structure of the first erection was necessary, and more permanent materials had been used in its construction.

It was a surprise to me, and wonder to many others, that Sir Joseph Paxton, who astonished the world with the Crystal Palace of 1851, had not been secured to have carried out the erection in 1862. I doubt not the erections would have been in far better taste, and equally convenient for all the purposes of the exhibition.

Comparison of the Erections of 1851 and 1862.

The exhibition buildings of 1851 occupied, in all, nearly nineteen acres; those for 1862 cover a little over twenty-six acres. The flooring space in 1851 was 989,784 square feet. In the present building there are 1,140,000

square feet; but as the machinery and agricultural implements are exhibited in wings especially built for the purpose, the space at the disposal of the commissioners was practically 450,000 feet of flooring more than in 1851. The elevation and ground plan accompany this report. The total length of the first exhibition building was 1,841 feet, by 450 feet wide. The present building is 1,152 feet long by 642 feet broad, exclusive of the annexes. One-half of the building, both on the floor and the galleries, was devoted to the exhibition of the products of Great Britain and her colonies, and the other, the west, to the productions of foreign countries.

The annexe for the machinery department was detached from the main building, and was 870 feet long by 200 feet wide. On the opposite side of the building is a shorter annexe, devoted to agricultural implements and machinery not in motion, and miscellaneous objects of a less ornamental character than those which occupy the main body of the exhibition.

Opening of the Exhibition on the First of May.

[From London Paper.]

"It was in all respects worthy of the occasion; and to the grandeur of the scene were added the magic of music, and the indescribable charm of youth and beauty and fashion. Everything that could add to the magnificence of the effect—in the absence of our beloved Queen and her lamented husband—was given with a liberal hand, and the festival of May-day, 1862, was indeed glorious and enchanting. Our May-day of 1862 was no ordinary May-day. In the broad light of day, in the presence of assembled thousands, surrounded by all that is high in station or great in talent, it was the proud lot of English statesmen and nobles to render homage to human industry and genius and skill, and to ask the world in like manner to recognize their triumphs, so fraught with blessings to our common race. The people—by whom all that is great in the world's history has been achieved, who have bridged over oceans, who have removed mountains, who have planted deserts with busy life, whose works of art (lasting as the sun's glad light or the air's balmy breath) proclaim what man in his majesty can do—are formally recognized by royal princes and crowned heads, and the exhibition of their works draws together a multitude such as a congress of all the kings in christendom would fail to collect.

"The International Exhibition is an industrial one such as the world has never yet witnessed, and of which labor—working contentedly at the loom or in the mine—has never dared to conceive. Here was collected, from every quarter of the globe, the choicest gifts of nature and the most finished productions of art. The 'frozen North' enters into rivalry with the 'sunny South;' 'the far West' challenges a comparison with the older and more experienced 'East.' Race there contests with race for fertility of invention or for delicacy of skill. Each country will see what it can do better than its neighbors; what its neghbors can do better than it; and will, in consequence, throw down the barriers which the past, with its prejudices, and its hatreds, and its narrow rivalries, has been too ready to build up."

The exhibition thus formally opened, was placed in charge of the jurors,

who commenced their labors on the 7th of May, and completed their labors early in July, and the awards were publicly declared in the building on the 11th day of July. His Royal Highness, the Duke of Cambridge, K. G., as Her Majesty's representative, received and distributed the awards to committees representing the exhibitors of the United Kingdom, and to the commissioners of the colonies and dependencies. The special representatives of foreign countries received and distributed the awards to the foreign commissioners. Those for the United States were received by the American Minister, Mr. Adams.

Instructions by which the Jurors were Governed.

We give a condensed account of the arrangements by which the articles were brought before the jurors, and the principles by which they were governed.

The jurors were instructed that prizes were to be awarded *for merit, without any distinction of degree, and without reference to competition between producers.* The best manufacturer in any particular branch of industry was not alone to be rewarded, but all producers, who showed by their exhibits that their products were excellent in kind, were entitled to a reward.

As to *raw materials*, medals were awarded for novelty in the mode of attaining and applying and adapting raw materials and produce; for skill and excellence in known methods of applying or adapting them; for excellence in the quality obtained, combined with utility; for the value of instructiveness of any series exhibited.

As to *machinery, including twelve classes*, the jurors were instructed, for railway, manufacturing and general machinery, to be careful in admitting claims of novelty of invention without sufficient scrutiny. The necessity of this was apparent, as multitudes of new inventions on a hasty examination may appear really valuable, but a thorough examination and trial may prove them useless. Fitness for the object sought to be obtained, economy in its first cost, stability and economy in maintenance, and excellence in workmanship.

Manufacturing Machines.—Economy in the production of the articles manufactured, the saving in time, and the quantity produced. The importance of these requirements is obvious, for articles might be manufactured of great excellence, and yet at an expense that would render them altogether too expensive for general use.

As regards carriages: in respect to those of luxury, the successful application of any new material, with elegance of design and excellence of workmanship, strength, lightness, and reasonable cheapness—these were all to be considered. Carriages of transport and for public service: lightness, sufficient solidity for safety, durability and cheapness, were to be taken into consideration. The exhibition in this class showed that these requisites had been attended to, and the marked improvement in that respect, over the exhibition of 1851, was most apparent.

Agricultural and Horticultural Implements.—These were to be judged by the conditions under which the leading agricultural societies made these awards in their periodical exhibitions.

Civil Engineering, Architectural and Building Contrivances.—Science and skill in design, to obtain the object sought with the greatest economy; fitness in the application of materials; success in the work in which the model or drawing is exhibited; and perfection of workmanship in the model or drawing exhibited, were all to be taken into consideration.

In Military Engineering, &c., and Naval Architecture.—Combinations in the models or drawings relating to military engineering; advantages obtained by experiments in carrying out the means proposed, either by models or drawings; improvements in arms, apparatus, or any articles belonging to military or naval service or architecture; to rigging or other branches of seamanship; to accoutrements or equipments of troops; their fitness, efficacy and economy of production.

Philosophical Instruments.—Novelty of inventions, or novelty in the whole or part of the instruments exhibited; ingenuity of construction, new application of old principles, application of new principles, improvements in beauty of form, increased durability, extended applications, excellence and precision in workmanship, economy of production; all these were to be taken into consideration in passing upon articles exhibited in this class.

In Photographic Apparatus and Photography, the same considerations were to be observed as are stated in regard to philosophical instruments. In regard to photographic impressions, novelties in the mode of production, durability, excellence in the results obtained, and artistic merit, were to be kept in view; as it regards photographic materials, novelty, or new applications, increased sensitiveness or powers of retention, and facilities of operation were to be favorably considered.

Horological Instruments were to be considered as to their ascertained or probable accuracy and certainty of performance, whether in time keeping, discharging of striking parts, or registering; stability, strength and durability, simplicity and economy of construction, goodness of execution and high finish, were to be considered as subordinate to precision and accuracy of construction.

Musical Instruments required novelty of invention, novel application of old inventions, improvement of mechanical action, tone, perfection of workmanship, beauty of design combined with general excellence, increased facility of action, cheapness combined with durability.

Surgical Instruments required novelty of a useful character, giving evidence of originality and inventive power, ingenuity in the application, extension or modification of principles already known, or for new combinations; mechanical skill, including cheapness, finish, and other qualities of mechanical execution. These include the twelve classes of machinery.

Textile, Felted and Laid Manufactures, comprising twelve classes.—As the ground work of the awards, increased usefulness, such as permanence in dyes; improved forms and arrangements in articles of utility; superior quality or superior skill in workmanship; new use of known materials; use of new materials; new combinations of old materials; beauty of design in form or color, or both, with reference to utility; cheapness, relating to excellence of production.

Educational Works and Appliances were to be judged of by their fitness for their purpose, for their illustrative character and economy of production.

Metallic, Vitrious and Ceramic Manufactures, five classes.—These were to be examined to ascertain whether the articles exhibited showed inventions or discoveries as to economy, increase or perfection of production; regularity of manufactures, combined with excellence of design; novel application of known discoveries; increased utility, combined with novelty and beauty; excellence of workmanship and utility.

Dressing and Traveling Cases were to be judged of by novelty of material or application; excellence of design, material, workmanship and cheapness.

It will be seen that if these general instructions were carried out fairly, as it is believed they were in a very great degree, that the exhibitors could have little cause for complaint. The jurors might, and they undoubtedly did differ with the exhibitors as to the merit of particular articles, but the grounds upon which their decisions were based were such as to command the general acquiescence of the exhibitors as to the decisions finally made.

The exact number of medals voted by the jurors was 6,992, and the honorable mentions 5,308—12,300 in all.

Every effort was made to have every article present examined by the jurors, and it is believed the omissions must be comparatively few in number; the jurors being desirous of giving attention to every article entered.

As regards the exhibition from the United States, although limited in number, for reasons given in this report, every desired attention, it is believed, was shown to them by the jurors, as will appear by the awards which were made to articles from this country.

Jurors from the United States.

There were only five jurors representing the interests of the United States, viz: F. B. Taylor, on class eight, machinery in general; Wellington Lee, class nine, agricultural machines and implements; Frederick Smyth, class fourteen, flax and hemp; J. R. Black, M. D., class sixteen, musical instruments; Henry Stevens, F. S. A., class twenty-seven, stationery. Mr. Taylor was also assigned to a special jury on fire engines. These gentlemen were all men of intelligence, and admirably adapted to the duties devolved upon them.

It is due to the intelligent gentlemen composing the jurors, to state that they manifested an earnest desire to do full justice to the exhibitors. The English jurors, who comprised more than half of the whole number, were selected with great care, and were men generally well qualified to judge in their respective classes, and, so far as I had information, they evinced a desire to examine the articles presented before them with great fairness, and to reward merit wherever found, without regard to the place from which it came.

Our exhibitors were placed in a very different position from those of other nations. No provision was made by the government for conveying even the articles, as in 1851; nor was any provision made for the expenses which necessarily had to be incurred after the arrival of the goods at London. Under these circumstances, great credit is due to those exhibitors who had the enterprise to be present in this great exhibition, such as the world had never before witnessed, and whose contributions, as the result

proved, were most creditable. When the inquiry was made, as it often was at the United States department, why we were not more fully represented, and when the reason was given as above, the expression uniformly was, "under such circumstances you have done well for your country."

The awards which have been given to our articles are the best testimonials we could desire. It is believed that the United States exhibitors have presented more new and valuable inventions than any other country; and had the articles which were approved by the executive committee of the United States Commissioners at Washington been all on exhibition, we feel assured that the result would have showed a larger number of new and useful inventions than from all the other nations which were represented in the exhibition. Enough, however, was shown to exhibit to the world the enterprise and ingenuity of our citizens; and that since 1851 our country had been alive to the advance that was necessary to be made in articles of utility and comfort, adapted to all classes and countries. No higher tribute was desired than that which was given to the articles on exhibition—that they were calculated to benefit mankind, to reduce "the cost of production in agriculture, commerce and the mechanic arts," as did those shown in the exhibition of 1851. A distinguished English gentlemen, connected with both exhibitions, said to me after the jurors had completed their awards, "you have taken as large a share of the prizes as in 1851." I said to him, "this was unexpected; but if the articles we had entered, and which were ready to be forwarded, had been present, I should have expected such a result."

I examined the industrious and useful divisions of the exhibition with care and attention, and while I found a very great advance in these departments since the former exhibition, it was apparent that the improvements had resulted from that exhibition mainly, and that but comparatively few new implements and machines were on exhibition. Changes had been made, implements and machines simplified and cheapened in prices, and far better adapted than formerly to the demands of the world.

Until the jurors had added their sanction to the value of our contributions, but little attention was given to the United States department; but when the awards of the six hundred and fifteen jurors had been officially announced, the United States department was no longer without a crowd of visitors daily, to see what had come from this far-off land—where a contest unexampled in the history of our race was being carried on—to benefit the world. A short time after the awards were officially proclaimed, the leading public journal in London, in giving the account of the persons in attendance the preceding day, remarked that the great rush was to the machinery in motion. Next to that, "to *the United States department*, which had many *clever articles*, and the awards of the jurors had stamped their value, in the way of new and valuable inventions," and the public *was advised* to give attention to this part of the exhibition, which was of great value. This advice was heeded, and the United States department did not fail of receiving attention from the first in the land, and from the most distinguished from foreign countries; while *the great middle class* for whom we labor, and to whom our inventions will bring relief, was ever on hand in large numbers, examining with great scrutiny the inventions from which

they hoped to receive benefit, as they did from those in the exhibition of 1851, which are to be found not only in Great Britain but in every country on the globe where agricultural implements and machinery are used.

Presentation of the Awards.

The description of this interesting ceremony is abridged from the London *Times*, July 12th, 1862.

The International Exhibition.

Yesterday the exhibition bore its first fruits to anxious exhibitors, in the public assignment of the jury medals and awards. Nothing was spared by the executive to make this State ceremonial the pageant of the season. It was arranged and rearranged, international co-operation was invited, rules were laid down, which, for once, were not departed from, and, in fine, to make assurance doubly sure, even the chances of miserable weather were guarded against by a double programme, for a fine or wet day, being issued, either of which was to be adhered to as the occasion suited. The result of all these deeply laid combinations and arrangements was, fortunately, success; a success so complete that there was almost a monotony in the punctual and undeviating regularity in which every event in the programme succeeded each other to the very second. When once the procession formed and started, people could tell by their watches where it was, and what it was doing in any part of the building. Nor was it only a success of mere routine programme—it was equally successful in its enthusiasm, its pageantry, in the satisfaction it gave, and, though last not least, in the weather which attended it. The latter has recently formed a topic of such universal conversation and regret, that it would be unnecessary to refer to it here, were it not a most noteworthy fact that it for once proved propitious to a display in which the Horticultural Gardens were connected or concerned.

The ceremonial of yesterday, we may state, was merely to assign the awards, not to deliver them—in fact, the medals themselves will not be ready till the exhibition draws near to its closing days. It has been felt, however, that to defer the announcement of honors won to that comparatively distant period, would be to deprive the exhibitors of more than half the advantages that ought to accrue from their successful competition. Much of whatever value attaches to the medals consists in exhibitors being able to announce their triumph while the exhibition is still a living fact.

Though the attendance of visitors on this occasion was more than double that which crowded to the opening, yet, from some cause or other, the interest evinced in the proceedings bore no manner of relation to the eager curiosity with which every event of the 1st of May was watched. There was no long line of carriages blocking the way to the building as early as 8 o'clock, nor at 9; nor even at 10—when the hour for opening came—was there anything like what could fairly be called a crowd about the doors. At all the doors, however, there were groups in waiting, for the caution which we ventured to give in these columns, against overcrowding at the eastern entrance, appeared to have had the desired effect, and visitors were equally distributed at all the doors, and passed in rapidly and without

inconvenience. Short as had been the time allowed for preparation and arrangement, a good deal of change and of improvement also had been effected in the building. Stout barricades had been erected along almost the entire length of the very circuitous route which the procession had to traverse. In the nave the line was kept by rows of seats secured together, all of which in front were reserved for ladies. The stations where the awards were to be made were marked by small but very pretty trophies of flags and garlands, and some of those on the foreign side, especially that of France, were not only exceedingly beautiful, but costly as well. Round these stations were grouped some of the best and most appropriate objects which could be culled from the exhibition of the country to which the station belonged. All the marble columns, pedestals, and tables which could fairly be used for such a purpose, were ornamented with fine fuchsias and flowering plants, so that the first glance down the nave, before visitors began to fill it, showed such a succession of beautiful and well arranged groups, such a mingling of form and color, all that was lovely and attractive in nature and art—as has never been so well displayed in the nave before. It was not long, however, before the throng of visitors restored to it much of its accustomed aspect—its rows of brilliantly dressed ladies, its eager, hurrying visitors, all seeking for places along the line of the procession, every one of which, of couse, was occupied ten minutes after the opening of the building, though all the occupants knew perfectly well that they must sit out at least four hours before their long investment of time and patience would be rewarded. The time thus passed, however, was by no means without attraction. There were bands in all parts of the building. It would, perhaps, be hypercritical to say that there were, if anything, rather too many, and that, beyond a doubt, some were placed too near each other for any to judge of the peculiar merits of each. It will meet the facts of the case to say that there were certainly plenty of military bands, and no lack of music. This entertainment was for those who wished to hear, and for those who wanted to see there was even more. The nave filled on each side; then the galleries, as the next point of vantage, began to be lined with crowds, and, as the seats here became more and more scarce, the salient angles along the trophies of the nave began to fill as well. Mr. Peters' drag and Chance's light-house were, of course, occupied; then Bell's obelisk, and then the stairways leading to the galleries; and, lastly, the roofs of the cases in the galleries found occupants, as did every other spot from which the ceremonial could be seen, with very many from which it could not be seen at all.

In the Horticultural Gardens the crowd along the route of the procession was very great. What were actually the numbers in both building and gardens it is difficult to guess. The official return gives no clue, as there was some misunderstanding, so that it was impossible to ascertain who came in by season tickets and who by payment. At some entrances the visitors were counted in, and at others, evidently, they were not counted at all. The returns up to one o'clock, when the ceremony began, gave 32,000 visitors, and the total was brought up at the close to 44,278. The mystery of these figures may, no doubt, be explained hereafter, but in the meantime we may state that, in the opinion of those best qualified to judge of

the numbers, there were upwards of 70,000 visitors present. The dais, where the chief portion of the receptions was to take place, was erected over the site intended for the exhibition memorial of 1851. The throne was the same as that used at the opening ceremony, and the workmen were still engaged in its completion as the public were admitted to the gardens. Round this throne, at either side, the visitors collected in dense rows, quite encircling the reservoir, and stretching down the center avenue to the exhibition. Viewed at a little distance and from an elevation, the assemblage, as thus distributed round the reservoir, had a most curious appearance. The water looked like a gigantic mirror, and the visitors its richly-colored frame. As in the building, so in the gardens there was no lack of music. Bands were everywhere—in the conservatory, the music-houses, the terraces, and on the lawns. All, however, were thus heard to advantage, and none interfered with the other.

The first small elements of the procession were, as usual, collected round that great public and private rendezvous—Benson's clock. Here the jurors and their chairmen collected in every variety of morning and evening dress, uniforms naval, military and volunteer, court costume, academic and civic robes. One or two were conspicuous in many-colored silk embroideries, while others were radiant with gold lace and bullion. As the weather at this time looked very threatening, it was thought advisable to commence the proceedings at once, or, at least, to bring out all the jurors into the open air. Headed by the band of the Royal Engineers, they passed into the gardens, sweeping round the west side to the foot of the raised dais, and here they stopped. It was then half-past 12. The gardens and the building were thronged, though the returns at this time showed little over 25,000 visitors. In the conservatory the members of the cabinet, the Royal Commissioners for 1851, the Lord Mayor and his suite, the council of the Society of Arts, the council of the Horticultural Society, and the members of the finance and building committees had been gradually assembling, the arrival of each notability being always announced by cheers more or less vehement from the crowd outside the northern entrance to the gardens. Earl Russell was among the first arrivals, and therefore to a great extent escaped recognition from the crowd, as did also Mr. Gladstone and Mr. D'Israeli. Lord Palmerston, however, was recognized, and the cheers with which he was greeted could be heard plainly in the gardens, just as the cheers he afterwards received in the gardens could have been heard outside.

His Royal Highness the Duke of Cambridge, attended by Colonels Tyrwhitt and Macdonald, came in shortly before one o'clock. Then followed in rapid succession Lord Taunton, Mr. Lowe, Sir Charles Eastlake, Sir George Grey, the Duke of Argyle, the Duke of Newcastle, Sir Cornewall Lewis, Sir Charles Wood, Lord Portman, Mr. W. Cowper, Sir A. Spearman, and Mr. C. W. Villiers. The Royal Commissioners for the present exhibition—Lord Granville, the Duke of Buckingham, Sir W. Dilke, and Mr. Fairbairn—received all as they arrived. Among the first of the special international representatives was His Highness the Pasha of Egypt. He wore the plain blue frock coat and fez of a Turkish officer, but his breast was covered with stars and orders. His Royal Highness Prince Carignan was in full uniform, and when he issued forth in the procession was taken by many for

Prince Louis of Hesse, whose name was in the official programme, but who, of course, was not present. The following are those who did in fact take part in the ceremonial:

Austria.—His Excellency Count Apponyi, Ambassador at the court of St. James.

Bavaria.—His Excellency M. de Cetto, Minister at the court of St. James.

Belgium.—His Excellency M. Rogier, Minister of Foreign Affairs, Belgium.

Brazil.—His Excellency Commander Francisco Ignacio de Carvalho Moriera, Minister at the court of St. James.

Denmark.—His Excellency M. Torben de Bille, Minister at the court of St. James.

Ecuador.—His Excellency Senor Antonio Flores, Minister at the court of St. James.

France.—His Excellency M. Thouvenel, Senator of France and Minister of Foreign Affairs

Frankfort.—Senator Bernus.

Hanover.—His Excellency Count A. Kielmansegge, Minister at the court of St. James.

Hanse Towns.—Bremen and Hamburg—M. Geo. Joachim Göschen, Hanseatic Consul-General in London.

Italy.—His Royal Highness Prince Carignan.

Mecklenburgh-Schwerin and Mecklenburgh-Strelitz.—Baron de Maltzahn de Vollrathsruhe.

Netherlands.—M. J. W. L. Van Oordt, President of the Royal Commission of Holland.

Portugal.—His Excellency Count H. E. Lavradio, Minister at the court of St. James.

Prussia.—His Excellency Count Redern, Minister to His Majesty the King of Prussia at Brussels.

Saxony.—His Excellency Baron de Buist, President of the Council and Minister of the Interior to His Majesty the King of Saxony.

Spain.—His Excellency Don Antonio Gonzales, Minister at the court of St. James.

Sweden and Norway.—Baron Beck Friis, Chargé d'Affaires for Sweden and Norway.

Switzerland.—Mr. John Rapp, Consul-General for Switzerland.

Turkey.—His Highness the Pasha of Egypt.

United States.—His Excellency the Hon. Mr. Adams, Minister at the court of St. James.

Wurtemberg.—His Highness Prince Hermann of Saxe-Weimar Eisenach.

It was one o'clock as the last of these representative guests arrived, and at once the *cortége* quitted the conservatory and passed down to the daïs and throne. The Viceroy and Prince Carignan walked on either side of the Duke of Cambridge, and all these were loudly cheered, though not more, if even as much, as the Premier. Lord Granville, too, received a special and most cordial welcome. On the daïs the whole *cortége* formed in a brilliant group, while Lord Granville, accompanied by his brother commissioners, advanced in front of the throne and addressed the international guests as follows:

"I have the pleasure of welcoming, on the part of Her Majesty's Commissioners for the International Exhibition, the distinguished representatives of foreign nations who honor us by taking part in the proceedings of this day. The readiness with which the governments of foreign countries have responded to the invitation of the English government is highly appreciated by the people of this country. I have now to request that the special representatives will receive the report of the council of chairmen of juries. The awards will then be delivered to Her Majesty's Commissioners. We invite the assistance of the special representatives to make the awards known in the building, as it will be agreeable to the exhibitors of the several countries to learn from a distinguished representative of their own nation the appreciation by the juries of their successful labors. In passing through the building, the special representatives will not fail to observe that the industry of all nations has shown a remarkable development since the last International Exhibition—a development which, justifying the anticipation of an illustrious Prince, now, alas! no more, owes much to the facility given by such exhibitions for comparing the state of industry in each country, and affords a starting point for further progress."

Lord Taunton, as president of the council of the juries, then read the following very interesting report:

"The work of the several juries having been brought to a termination, it becomes the duty of the council of chairmen to explain the manner in which the juries were constituted, and the result of their labors.

"The juries consisted of English and foreign members, in varying proportions. The English jurors were in the first place nominated by exhibitors, and, these nominations having been carefully considered, Her Majesty's Commissioners invariably appointed such persons as appeared to be named by the general agreement of a trade or district. In cases where the nominations were not made on a common understanding, the Royal Commissioners were guided in their choice by the number of votes given to particular individuals, and, in some instances, by the desire expressed by exhibitors that the commissioners should themselves select persons possessing the necessary qualifications.

"The British colonies were represented by jurors recommended by the several Colonial Commissioners.

"Foreign nations taking part in the exhibition had a right to nominate one juror for every class in which they were represented by 20 exhibitors, and for every section of a class in which they had 15 exhibitors. As an alternative, each nation had a certain number of jurors allotted to it, in proportion to the space which it occupied in the building, and several countries accepted this alternative. Her Majesty's Commissioners, without fixing any arbitrary proportion between foreign and English jurors, appointed as many of the latter to each jury as the experience of past exhibitions showed to be necessary for its efficiency.

"The juries were 65 in number, grouped so as to form 36 classes, or head juries, corresponding to the 36 industrial classes under which the objects are arranged in the exhibition. Each of these head juries, when subdivided into sections, acted as a united body for the confirmation of awards. Before, however, these awards were considered final, they were

brought before and received the sanction of a council, consisting of the chairmen of the 36 head juries. The chairmen forming the council which regulated the affairs of the juries were nominated by Her Majesty's Commissioners from the jurors of different nations, a number being allotted to each country relatively to the space assigned to it in the building. The council was presided over by a chairman appointed by Her Majesty's Commissioners.

"Her Majesty's Commissioners decided that only one description of medal should be awarded by the juries. This decision considerably facilitated their labors, as it became necessary only to reward excellence wherever it was found, without reference to competition between exhibitors. As the work of the juries advanced it was ascertained that many articles possessed excellence of a kind which deserved a special mention, without, however, entitling them to a medal; and, although it involved some departure from the principle that had been originally laid down, yet the council of chairmen acceded to the wish of the juries, and permitted such cases to be classed and published under the title of 'honorable mentions.'

"The jurors and their associates engaged in examining the objects of the exhibition amounted to 615 persons, of whom 287 were foreigners and 328 English. They are men of high social, scientific and industrial position, drawn from nearly every civilized country in the world. Their labors have occupied two months, and have been of the most arduous description, as they had to examine the objects displayed by at least 25,000 exhibitors. It can scarcely be expected that none of the articles exhibited have escaped their attention. In a few instances the delay of arrival or of arrangement has rendered it impossible for the juries to examine every article now within the building; while, in other cases, errors in classification have rendered it doubtful to which of the juries the duty of examining some particular object should fall. Every effort, however, has been made to conquer these obstacles, and the omissions, if any, must be very few in number, and are not owing to the want of attention of the juries or of the officers engaged in facilitating their work.

"The number of medals voted by the juries amount to nearly 7,000, and the 'honorable mentions' to about 5,300. The proportion of awards to exhibitors is greater than in the International Exhibition of 1851, but less than in that of 1855.

"Notwithstanding the varied nationalities represented in the juries, it is gratifying to record that the utmost harmony has prevailed during the whole time that the jurors have been associated in their labors. The mutual dependence and intimate alliance between the industries of the world have been illustrated by the zealous and impartial efforts of the jurors of different nations to recognize and reward the merit displayed in the exhibitions of their industrial competitors.

"We are glad to observe that the state of industry, as shown in the international exhibition, gives evidence of a singularly active and healthy progress throughout the civilized world; for, while we find every nation searching for new raw materials, or utilizing products hitherto considered as waste, we are struck especially with the vast improvement in the machinery employed to adapt them to industrial purposes, as well as with the

applications of science and with the great and successful attention which is now given to all the arts necessary to gratify our taste and sense of beauty.

"We cannot conclude this report without expressing our obligations to Dr. Lyon Playfair, the special commissioner for juries, for the constant and intelligent assistance which he has rendered to us throughout our labors, as well as to the deputy commissioners and secretary who have acted under his direction, and have afforded efficient aid to the several juries during their inquiries."

To these addresses the Duke of Cambridge made the following reply:

"In performing the duty entrusted to me by Her Majesty on this occasion, I have great pleasure, on behalf of the representatives of the various nations which have taken part in this exhibition, in receiving from your lordship an account of the labors of the juries. All countries owe a debt of gratitude to the large number of jurors, who, at a great sacrifice of time and personal convenience, have gratuitously undertaken a work of such an arduous description. The efforts made by so many distinguished men of different nations to recognize and reward the exhibitors from all parts of the civilized world cannot be too highly appreciated. I have every confidence that the decisions of the jurors will meet with general approbation, and that the knowledge acquired by them in the discharge of the duties, which they have so well performed, will be the means of giving a new impulse to industrial progress in the countries which selected such eminent representatives of their scientific and manufacturing skill."

This ceremony over, the jurors each passed in front of the daïs, bowing to the royal and distinguished personages there assembled, and passing down at the eastern side, and, ranged up in line, waited till those who were to take a chief part in the ceremony had gone to the front.

The procession then formed, and passing round the northeastern end of the Horticultural Gardens, along a pathway which was lined on both sides by a thickly packed crowd, the procession entered the building at the north end of the eastern annexe, and the loud fanfare from the trumpeters announced to those in the building that the spectacle for which they had been patiently waiting for some hours was at last approaching. The first award was delivered at the northern extreme of the eastern annexe, where were assembled the committees of classes 3 (substances used for food); 4 (animal and vegetable substances used in manufactures), and, 9, agricultural implements. Here a slight halt was made, and the Duke of Cambridge handed to Mr. Wolloton, the Mayor of Liverpool, and the Earl of Clancarty, the chairmen of these committees, the awards in their respective classes. At the south end of the annexe the awards for mineral and chemical products were delivered to the Mayor of Swansea and Mr. Stenhouse, F. R. S., and the procession then entered the main building, and passed along the eastern side of the northeastern transept to the eastern daïs, where, at the foot of the Victorian gold trophy, were assembled the representatives of the British colonies. Here a long halt was made, while the Duke of Cambridge distributed the awards in this class. To many persons this was one of the most interesting parts of the ceremony. The magnificent display which has been made by our colonies has created a

deep impression on all who have visited the exhibition to study it seriously. On foreigners particularly these courts, through which visitors seeking only for something striking have passed heedlessly, casting only a passing glance at their manifold natural riches, have conveyed a more striking idea of the greatness of England than even the varied marvels of industrial skill and energy which are to be found in those parts of the building devoted to Great Britain proper. The extent of the British empire was more completely typified by that small group congregated round the gold trophy than by any of the most eloquent metaphors which have hitherto been in use among poets and orators. There were there representatives not only from every quarter of the globe, but from every climate, almost from every degree of latitude from the frigid to the torrid zone, not to go into the more complex divisions of ethnology. Considering the pains which each of our colonies has taken, with hardly a single exception, to give to the world an adequate idea of its peculiar resources and capabilities, the immense difficulties of transport which some of them have to contend with, and the general success which has attended their efforts, it was no wonder that in advancing to receive the awards from the Duke of Cambridge their representatives were loudly cheered. Dr. Forbes Watson and Mr. Dowleans, to whose joint energy and care is owing that wonderful epitome of the vast resources of our Indian empire which has attracted so much admiration, first advanced to receive the Indian awards.

As the procession rounded the south side of the fountain, where were stationed the united bands of the 2d Life Guards and Royal Horse Guards, to the head of the stairs, the view down the nave was magnificent. There was a clear vista from one end of the building to the other, interrupted only by the Glasgow obelisk; and the broad path which ran down the center was lined entirely by ladies, whose gay summer dresses formed a fringe on both sides. Just at this moment, too, the sun, after a long struggle, broke from behind the thick clouds which had shadowed him all the morning, and lent a few rays, which played over the glittering mass and gave an additional beauty to the scene. The regulations laid down by the commissioners, which appropriated the seats to ladies only, were strictly complied with, and throughout the long line there was hardly a break in the rule of "ladies to the front." Seen from the eastern dais the scene was brilliant enough, but to those who had secured places at the western end and watched the procession as it advanced towards them, the *coup d'œil* must have been still grander. At the opening ceremony, where the procession squeezed painfully through two narrow pathways at each side, there was nothing comparable to the splendor of the moving panorama of the procession as it swept down the nave. At the Norwich gates the committees of classes 13, 15, 16, 17, 22, 30, 33, 34, 35 and 36 were assembled. Their chairmen received the awards from the Duke of Cambridge in the following order:

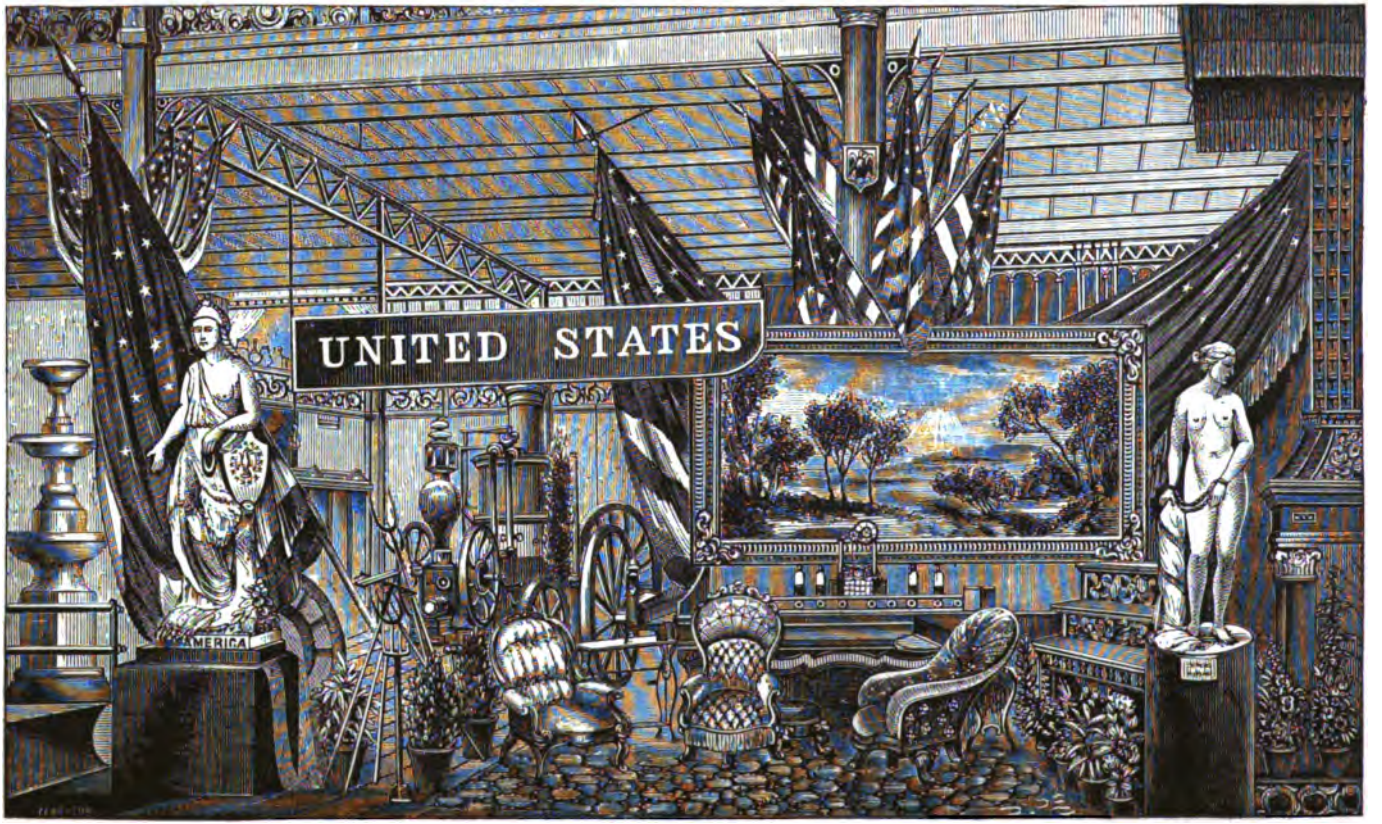
Philosophical instruments—Sir D. Brewster.
Horological instruments—Master of the Clockmakers' Company.
Musical instruments—Mr. Broadwood.
Surgical instruments—Mr. Cæsar Hawkins.
Carpets—Mayor of Halifax.

Furniture and decoration—Mr. Crace.
Precious metals—Master of the Goldsmiths' Company.
Glass—Mr. Chance.
Pottery—Alderman Copeland, M. P.
Dressing cases, etc.—Alderman Mechi.

A few yards beyond, the procession again halted opposite Emmanuel's trophy, where the following awards were distributed to the respective chairmen:

Photography—the Lord Chief Baron.
Cotton—the Mayor of Manchester.
Flax and hemp—the Provost of Dundee.
Silk and velvet—the Mayor of Macclesfield.
Woolen fabrics—the Mayor of Bradford.
Printed fabrics—Mr. E. Potter, M. P.
Tapestry and lace—Sir S. Northcote, M. P.
Clothing—Mayor of Nottingham.
Stationery—Master of Stationers' Company.
Educational—Right Hon. W. Cowper.

This was the last station in the British Department, and the procession now passed into the foreign half of the building, where extraordinary preparations had been made to do honor to the occasion. The commissioners for each country were assembled in front of their courts, and each station was tastefully decorated with national flags, rare exotic plants, and occasionally with some of the choicest works of art from their respective exhibitions. Each country seems to have vied with each other to make the best show, and, considering the short time there was to perform the work, the greatest praise is due to all the foreign commissioners for the zeal with which they seconded, and often outran, the suggestions of their superintendent, Mr. Owen. It was at Turkey and Egypt that the first awards in the foreign department were delivered, and as the procession neared this point the Arab band of the Viceroy, which was stationed in the rear, struck up a wild and exultant strain, which it would be difficult to class under any school known to western professors. The Duke of Cambridge's task was now nearly over, and the special international commissioners' duties began. The Viceroy of Egypt was the special commissioner for Turkey, and His Highness, who accompanied the procession from first to last, and was a special object of interest throughout, was loudly cheered as he advanced to present the awards for Turkey, and to the commissioners for his own pashalik. Opposite was the station of the United States, the principal decorations of which were Cropsey's fine picture of "Autumn on the Hudson," and the great steam fire engine. Here the awards were presented by Mr. Adams, the American Minister, and received by Colonel B. P. Johnson, United States Commissioner. Rome, the next station, was beautifully decorated with several of the best mosaics, which have been so much admired in the Roman court. In the absence of any special commissioner, the Duke of Cambridge presented the awards to Mr. Doyle, who, with Signor Bompiani, has had the arrangement of one of the most attractive portions of the exhibition. His Royal Highness also performed the same office for the South and Central American States, with the exception



AMERICAN TROPHY, INTERNATIONAL EXHIBITION, 1862.

of Brazil. This important empire had a station to itself, and the special commissioner, M. Carvalho Moreira, the Brazilian Minister at this court, presented the awards. The station of Portugal was fixed just on the spot where Dr. Salviati's mosaics have lately drawn such large crowds; and next to it was Italy, in such close conjunction that it was impossible not to remark in it a type of the union which is to take place soon in the alliance of their reigning houses. The great bust of Victor Emmanuel, and Magni's *chef d'œuvre*, "The Reader," were the chief ornaments of the Italian station. Count Lavradio presented the awards to Portugal, and the Prince Carignan to the Italian commissioners. Passing by Greece—where, in the absence of any special commissioner, the Duke of Cambridge presented the awards—the procession next came to the Russian station, which made an extraordinary display. Some of the finest mosaics and bronzes, which are the boasts of this portion of the building, had been brought forward, and the beautiful porphyry vases were filled with rare exotic flowers. The Spanish station, where Signor Balleras received the awards from Don Antonio Gonzales, the special commissioner, was very handsomely decorated with ferns and flowers, and over all was placed a fine portrait of Her Most Catholic Majesty. At Norway, the two characteristic figures of the peasants in their curious bridal dresses, which have amused all the visitors who have been lucky enough to find them out, with the beautifully sculptured font, were the chief ornaments. Baron Beck Friis presented the awards to Sweden and Norway. At the Danish station forty midshipmen, from the frigate which has just arrived in our waters, were placed with their band in the rear. Passing by Switzerland the procession next arrived at the French station, in the decoration of which the richest treasures of the court, in curtains, carpets and bronzes, were freely displayed. M. Thouvenel, the Minister for Foreign Affairs, acted as the special commissioner on this occasion, and presented the awards, which were received by M. Le Play. Holland was the last station in the nave; and on the western daïs—Belgium, the numerous States comprised in the Zollverein, and Austria received their awards. The Austrian station, in particular, was superbly ornamented with exotic plants, evergreens, and national flags, and two fine busts of the Emperor and Empress crowned the whole. From this point the procession passed down the machinery annexe, in which the Duke of Cambridge presented the award in classes 6, 7 and 8, entered the garden by the southwestern door, and again mounted the daïs from which it had originally set out. A combined performance of "God Save the Queen," brought to a close the second of the great *fêtes* of the International Exhibition of 1862.

Exhibitors from the United States, and a brief account of the different classes in which our exhibitors were represented.

Class I. Section 1. Mining, Mineral Products, &c.

Joseph W. Feutchwanger, New York, was an exhibitor of over 1,000 specimens of American minerals. This cabinet embraced very valuable specimens.

Thomas Meads, of Lake Superior, presented a splendid cabinet of copper and silver ores, and crystals and native metal, for which an honorable mention was awarded.

The exhibition in this class was one of extraordinary merit—such a series of collections so ample, and affording such an opportunity for comparison, as the old world has never before seen. The number of exhibitors was 1,955, of which 441 where English.

New Jersey Zinc Company, specimens of Speigel iron, produced from Franklinite, for which an honorable mention was awarded.

J. Morsheimer, delegate from Nevada Territory, exhibited a beautiful collection of silver and gold ores, and quartz from the celebrated Washoe mines; also samples of cinnabar (quicksilver) ore, for which a medal was awarded.

Dr. Wm. Boyle, of California, also contributed minerals.

Dr. C. Precht, of San Francisco, specimens of cyrstalized gold and California marble. Gold quartz from the celebrated mines of General J. C. Fremont, Marriposa county, California. The coal division of this class, for fuel, was far in excess of the exhibition of 1851.

CLASS II. CHEMICAL SUBSTANCES AND PRODUCTS.

M. H. Bagley, New York, crystal carbon oil for lamps.

F. S. Pease, Buffalo, N. Y., samples of carbon and oils for lamps, lubrication and illumination. P. Medal.

H. G. Hotchkiss, Lyons, N. Y., wintergreen oil; for excellent quality of product, P. Medal.

B. M. Rhodes, Baltimore, Md., barrels superphosphate of lime.

A. Hale, Lyons, N. Y., essence of peppermint. Honorable mention. See B.

College of Pharmacy, Philadelphia, for collection of North American vegetable drugs, and preparations made from them, P. Medal.

CLASS III. SUBSTANCES USED FOR FOOD.

Glen Cove Starch Co., New York, samples of starch from Indian corn. For excellent quality of products, P. Medal.

Kingsford, Oswego, N. Y., silver gloss starch. For excellent quality of products, P. Medal.

Hecker Brothers, New York, superlative wheaten flour, for which they received a P. Medal and high commendation.

Stebbins & Co., Rochester, N. Y., a barrel of very superior flour. An honorable mention.

O. Howland, Auburn, N. Y., samples wheat, Indian corn, buckwheat, barley, flax seed, beans, peas, and grass seed, &c., of excellent quality.

H. G. Hotchkiss, Lyons, N. Y., small samples of most of the same cereals as in Mr. Howland's collection.

Glen Cove Starch Co., N. Y., show samples of corn flour called "Maizeni," and they received a Medal and commendation for exceedingly excellent quality.

Kingsford, for Oswego Starch Co., also exhibited samples of corn prepared for same purposes.

J. Waddell, Springfield, Ohio, samples of Indian corn in the ear. Honorable mention.

Onondaga Salt Co., Syracuse, N. Y., fine samples of table and curing salt, of superior color and whiteness.

Dutcher & Ellery, New York, American hops.

Wilkins & Co., New York, bristles and hair.

There was a good exhibition of grasses and forage plants from the continent and from Great Britain and her colonies. The exhibition in this division was more extensive than in 1851; and the jurors say, generally speaking, in the manufacture of flour and meal, credit is due to the exhibitors for the great progress made since 1851. English millers exhibited flour of the French Gruaux brand, which in 1851 was only exhibited from France, and which is made of great excellence in England, and is a complete success.

The show of flour from the British colonies was very fine, and in keeping with the extraordinary wheat shown. Nothing exceeded their cereals in the exhibition. Two of the famous Gruaux millers in France exhibited this celebrated flour. It is prepared by a removal of the outer husk of the grain previous to its being ground. The process is similar to one in use in this country by Mr. Bentz, of Maryland, and is in some mills, we believe, in the city of New York, and has been since 1850 and 1851 in different parts of the country, but is not profitable so as to be in general use.

The Zollverein is well represented by flour from several different parts of Prussia.

Austria, however, which has always held a high position in the production of flour, has carried the day; and her magnificent productions of German milling are exhibited in a manner most worthy of her.

Italy shows samples of flour that cannot be surpassed. The Netherlands, Denmark and Bremen are well represented. Russia, Spain and Portugal show samples worthy of approbation.

The extensive milling trade of the United States was very well represented by two exhibitors, as the commendations and awards show.

The finest and most interesting flour from maize is that manufactured and exhibited by M. Bezet, a Frenchman, in the Algerian collection, who, as he states, removes that part of the grain around the embryo, containing the most fatty matter, so as to obtain a flour capable of great fermentation. This process, probably, is similar to that in the Gruaux process on wheat. This, if successful, as it seems to be, will be productive of great good where maize forms a leading element in the food of the people, and the United States are largely interested in its success.

Hops were much more fully shown than in 1851, and were represented by samples from every producing district in England, from two English colonies, from twelve European countries, and from the Northern States of America.

In regard to delicacy of flavor, brightness of color, and perfection of curing, English hops maintain their superiority over every other country. The samples shown from the United States were not of the best quality; and the finest ales require a different curing of the hops, which is not generally secured in this country.

CLASS IV. ANIMAL AND VEGETABLE SUBSTANCES USED IN MANUFACTURES.

H. G. Hotchkiss, of Lyons, N. Y., received a medal for very fine specimens of American essential oils. A prize was awarded him in 1851, and large sales of his oils are made in England and on the continent.

CLASS V. RAILWAY PLANT, LOCOMOTIVES, &C.

There was a good exhibition, but the jury say there is little of novelty as compared with 1851. Locomotives are now arranged to burn coal instead of coke, as formerly, on account of cost. Twenty locomotives were exhibited. Canada exhibited models of cars in use in this country and Canada.

The following entries were made:

Lawrence & Wright, Melrose, N. Y., sock, nut and ratchet washer, giving to bolts the firmness and safety of rivets.

J. E. Holmes, New York, model of improved pneumatic dispatch.

Rogers' Locomotive Works, Patterson, N. J., lithographs and photographs of locomotives.

J. C. Hoadley, Lawrence, Mass., model truck for locomotives.

G. F. Train, Boston, Mass., model street tramway carriage.

Remington & Sons, Ilion, N. Y., revolving stereoscope machine.

A. H. Howard, Alleghany city, Penn., car bumper.

W. H. Ward, Auburn, N. Y., self-turning railway turn-table.

CLASS VI. CARRIAGES NOT CONNECTED WITH RAIL OR TRAM ROAD.

Two only were exhibited from this country, by Brewster & Co., of Broome street, N. Y.; they were much admired and found ready sale. Since the exhibition of 1851, the English carriages have been reduced in weight about one-fourth, in all the carriages shown in the English department.

This improvement was suggested in 1851, and although not meeting with favor at that time, I am glad to find that it is now approved and adopted. The notice of our carriages by the jury, before referred to, shows how they are now appreciated.

CLASS VII. SEWING MACHINES, ETC.

Wheeler & Wilson, New York city, American sewing machines.

J. M. Singer, New York city, sewing machine.

Wilcox & Gibbs, New York city, sewing machine.

Howe Sewing Machine Co., New York city.

C. R. Goodwin, Boston, machine for sewing leather, soles of boots and shoes, &c.,

H. Wright & Co., tape braiding and tape sewing machine.

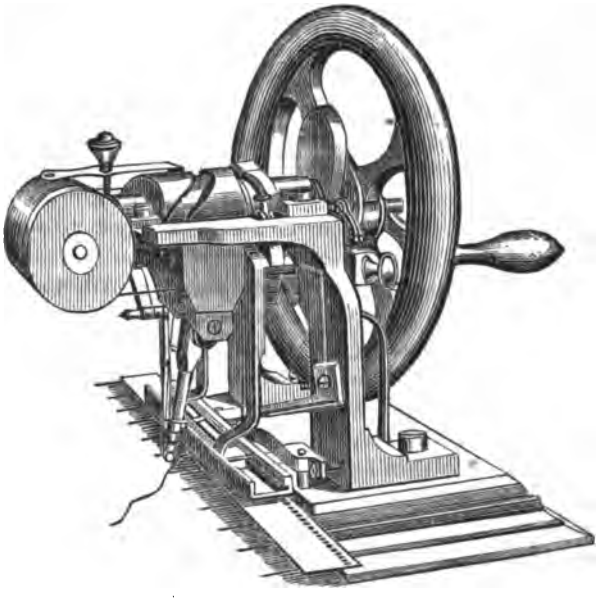
W. D. Richards, Boston, Mass., machine for sole cutting and heel trimming of boots and shoes.

C. O. Crosby, Boston, Mass., machine for preparing tape and joint trimmings and crimped rufflings.

A. Smith, West Farms, New York, power loom for weaving tufted piled fabrics; one entire row of tufts (108 or more) are placed by one operation.

These were all American inventions; and we give a description of these

machines from the London Mechanics' Magazine, which was published in the U. S. Catalogue.



Howe Sewing Machine.

The Howe sewing machine is entitled to priority of mention among those exhibited in the American court. His is the basis of all successful machines. Since the date of his patent, in 1846, various improvements have added considerably to its utility, without at all affecting its principle. That principle was the stitch formed of two threads by means of an eye-pointed needle, carrying a thread for one side of the goods, and a shuttle carrying also a thread for the other; the needle passes the thread in a loop through the cloth, while the shuttle passes its thread through the loop, when, by the combined action of the feed-motion, and a fresh passing of the shuttle through the loop, the stitches are drawn tight and interlocked within the body of the fabric, forming a tight seam, the stitch of which cannot be unraveled. The feed-motion, which is a combined patent of Howe, Wheeler & Wilson, Singer, Grover & Baker, is a very ingenious contrivance for propelling the work by means of a sarrated plate, by which the material can be turned at will to any desired curvature without interfering with the progressive motion of the fabric through the machine. This was suggested by a baster-plate which Howe had invented, but which the four motion feed has now superseded. It will thus be seen that the essential characteristics of Howe's invention may be thus enumerated :

1st. A mechanism for making stitches, or interlocking of thread, combined with an apparatus for making tension on the thread, and drawing up and securing each stitch when formed.

2d. An apparatus consisting of two surfaces, between which the material to be sewed is contained, and which support it against the thrust and

retraction of the needle, and in such a position as to permit the stitches to be drawn tight.

3d. An automac, intermittently acting feeding apparatus, which causes the material to pass with a regular movement between the holding surfaces, in the intervals between the punctures of the needle, with an unerring precision and uniformity of effect impossible to obtain by hand.

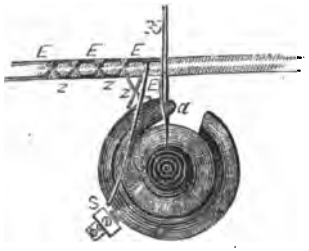
These three essential properties were never in use in any sewing machine prior to Howe's, and no machine has been subsequently made without them, in a more or less modified degree.

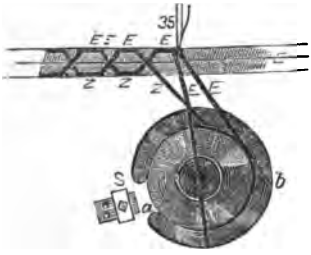
But Howe has improved marvelously and effectively, even upon these, by the invention of a cylinder machine. This is as great an advance upon his original as that was upon hand sewing; it is the introduction of an entirely new principle in sewing by machinery. All shuttle sewing machines make their stitch by the needle entering the material and remaining there until the shuttle passes and takes up the loop. By the cylinder machine, the needle pierces the material to be sewn, carrying its loop with it in its downward course, and leaves it within the material, then returns, when the shuttle starts forward, takes the loop and tightens the upper thread; the needle-arm is then lifted considerably, and the shuttle-thread by that means tightened. It will be seen that the stitch is thus made when the needle is out of the material, and, as a consequence, very close sewing, closer even than by hand, can be made. The cylinder machine carries the finest and coarsest needle, and will sew from one thickness of kid to the stoutest harness leather, with ease and facility; it also admits of anything being sewn upon it which cannot be laid flat upon the sewing plate of an ordinary machine—such as a narrow sleeve or the leg of a boot. The award of a prize medal to Howe's sewing machine will, we think, be acquiesced in by all its competitors.

Wheeler & Wilson's machine is very remarkable on account of the novelty of its construction. Here we have still the double stitch; but the "lock" is accomplished by means of a rotating hook instead of a shuttle. The underfeeding bobbin differs from those used in other machines. This bobbin is about the diameter and thickness of a florin; but between the two surfaces there is a deep groove, containing the requisite supply of thread. The bobbin is placed within the rotating hook, and winds off according to the demands of the machine. The rotating hook itself, larger in diameter than the bobbin, is the segment of a circle—a complete circle almost, but interrupted in its periphery by a kind of gash. The effective segment of the gash has a pointed end, which catches into the loop made by the needle, drags it round about three-quarters of its circuit, when the thread is released and pulled tight through touching a rest. The hooked wheel revolves again to catch a loop, and again to make a close stitch. But in these successive revolutions it not only catches itself into the down loop from the needle, but inserts the thread from the bobbin it carries. There is a small apparatus on the surface of the machine for spooling the thread. The tension is so regulated that the upper and under threads are used together equally, so that there are no loose stitches, and the seam cannot be drawn into puckers.

The annexed diagrams will tend, perhaps, to make the mode in which

this machine operates plain to the reader. The stitch is formed by the combined action of an eye-pointed needle, 35 (fig. 1), carrying the upper thread, *e*, a rotating hook, 5, and a double convex metallic spool carrying the lower thread. It will be observed that, the needle having descended, as it rises the line of thread upon its right is slightly looped. The point, *a*, of the rotating hook, 5, reaches the needle at this instant, passes close to its right side, and enters the loop of thread. As it further revolves, it enlarges this loop and carries it forward. As the loop slips from the point of the hook, and is drawn up, it will be found to inclose the lower thread, and interlock with it. The loop would slip from the hook when it had made little more than one-half of a revolution, and as it is drawn up by the hook in enlarging the next loop, it is necessary to hold it until the hook shall have completed the revolution and entered the next loop. For this office the loop-check, 36, is employed. It consists of a small brush, or an equivalent, held in slight contact with the periphery of the hook as it rotates, and thus holds the loop, as in fig. 1, and prevents its slipping until the hook has completed its revolution, and enters the next loop at the needle, as seen in fig. 2. The chamfered portion of the hook then reaches this check, and relieves the loop, which is then drawn up, as seen in the same figure; when this is so worn as not to check the loop, it should be adjusted. The Wheeler & Wilson machine is a pretty-looking, pleasant-working piece of mechanism, and at the present moment stands high in point of popularity.





The sewing machine of Wilcox & Gibbs is a single thread chain-stitch, against which some people have a prejudice, from its liability to ravel, or "run out." It is certainly possible, by undoing the finishing loop, to draw the whole out; but ordinary wear will not do this; and its beauty of stitch and great rapidity of operation render it useful for many kinds of domestic work. That it has held its own against the competition of shuttle-stitch and lock-stitch, is a proof of some goodness in it which is not to be despised. There is a curious history connected with this particular invention, as curious as that relating to the history of fluxions. In the latter case it has been matter of doubt whether Sir Isaac Newton or Huygens was the discoverer. It is said that the letter of the great English philosopher, announcing to the great Dutch philosopher his mathematical discovery, crossed the letter of the Dutchman to the Englishman communicating a similar result of intellectual grasp and effort. So it was with James Gibbs. He had never heard of a sewing machine. He had never heard of Duncan's, invented fifty years before. He was a homely, plodding farmer, in the mountains of Virginia, who took it into his head that he could dispense with "sewing days"—an American "institution"—not always to the liking of the master of the house, who does not care for an invasion of

needles and thimbles, upon appointed occasions, to put the family wardrobe to rights. A "sewing day," we take it, must be as terrible an infliction to the American husband as a "washing day" is to the English one. James Gibbs, without knowing what Morey and Howe had attempted, or were about, employed his active brains in inventing a sewing machine, and succeeded. The character of the stitch, and the method of forming it, bear some resemblance to those in the machines of Charles Morey, but the apparatus is superior in construction, and well adapted for a variety of domestic purposes. The great peculiarity in the mechanism is a "spur looper," which catches the slack down loop, retains it, and by its peculiar conformation holds the next down loop distended, so as to be caught again at the next revolution of the spur. By this arrangement there is no chance of a stitch being dropped, and the seam is as even and tight as can be desired. The shape of the needle and manner of adjusting it are secured by patent to James Wilcox, and the machine has the exclusive use of a convenient, self-acting, and noiseless stop, by which a reverse motion of the wheels is prevented, and also of a guard to protect the dress of the operator from the rubbing of the balance wheel. The apparatus for catching and looping the thread as it is passed through by the needle, consists of two arms, making together a cross at the end of a horizontal axis. As this revolves close to the needle under the cloth plate, one of these arms, shaped like a hook, and rapidly enlarging towards its base, catches the thread, and spreads the loop, which is then brought against the axis, and next slips upon the other arm, which gives the loop a twist and holds it. At the same time the needle goes up and comes down again through the cloth, carrying its thread through the loop already formed, when it is caught by the hook, and the first loop being released is drawn tight by the pulling of the hook in spreading the second. The twist given to the thread in forming the loop has a material effect in strengthening the hold of the thread in the cloth, and thus producing a very strong and durable seam. Its strength and little liability to rip may be readily seen by cutting a narrow strip across the seam of a piece of cotton thus sewed, and comparing it with a similar piece sewed by hand. On attempting to pull or rip the pieces apart, *it will be found that the former thus tested is the stronger of the two.* The tendency to ravel, hitherto the objectionable feature of machines of this class, is in this obviated by the drawing of the end of the thread through the preceding loop by the hook at the last stitch, and thus fastening it whenever it is broken by design or accident. If, however, this loop should be loosened and the end of the thread withdrawn, and then pulled, the whole seam may be raveled like knitting work; but this can only occur when an end is first loosened in this manner, and no such result is likely to take place in ordinary wear. The needle, being short and straight, runs with perfect exactness and certainty across seams, and even over several abruptly increasing thicknesses of cloth.

These machines have become the family instruments for sewing in a great many households in England as well as in America, and their great simplicity and ease of operation are strong commendations in their favor.

The machine of Mr. I. M. Singer has little in it to be described beyond the ordinary shuttle machine. It is manufactured under license from Howe,

whose machine it most resembles. There are some peculiarities about it as regards the spring tension between the spool and the needle, and the check-regulating wire. This machine has been largely used in manufactories—such as those for slops and soldiers' clothes. It has given employment to many hands in this direction. The firm has manufactured, from first to last, about 60,000 machines, 8,000 of which have been sold in England. Their manufactory in New York gives employment to 800 persons.

We have in a former number noticed Mr. Bigelow's boot-sewing machine, and, were it not a "sewing machine" in principle, there would be no need to mention it again. Sew, however, it does, and that the thickest leather, with as much facility as the other machines sew cloth or muslin. We do not know whether the shoemaker and tailor crafts be in danger by these machines; but looking at them from our own point of view, we are led to believe that their general use will be to exempt a large number of the present or coming generation from the sedentary occupations of the stool and the shop-board.

The American court is, undoubtedly, the great center of interest for sewing machines; and there may be some truth in the remark of a lady visitor to the exhibition—herself, however, an American—that if America had sent nothing else to the grand show of the industry and ingenuity of nations than sewing machines, these in themselves would have been a noble contribution. It is only those who have looked into the framework and mechanism of these, who are able to appreciate the ingenuity which was requisite to produce them, and, seeing them in operation, can value their utility.

C. O. Crosby, of Boston, Mass., machines for preparing tape and joint trimmings, and crimped rufflings. This interesting machinery is exhibited in connection with the Wilcox & Gibbs sewing machine, which has been adapted for the uses of the agents and manufacturers of the crimped ruffles, Messrs. H. Wright & Co., Friday street, London.

Alexander Smith, of West Farms, New York, exhibits a new power loom for weaving tufted fabrics. I cannot too highly commend this wonderful invention, and feel sure that manufacturers of carpets, and those who use them, will bless the inventor for this great addition to the means of adorning and making comfortable the habitations of men.

It has always been admitted that the "Axminster" is the most elegant and durable of all known carpetings, but, on account of the slow method of producing it by hand, the cost of it has been so great as to be beyond the reach of all but the most affluent.

The exhibitor, in view of this, was induced to apply his energies to the invention of a power loom for the production of this elegant fabric, and, after years of labor and a large expenditure of means, he has succeeded; and the loom on exhibition, and the fabric produced by it, are the best evidences of his success.

The most prominent advantages of this invention are:

First.—By the mechanical organization, the loom automatically inserts, weaves in, cuts off, and completes, one whole range of figuring tufts across the whole width of the fabric, in less time than is required for the making

of a single tuft by the hand loom, now and heretofore employed in making the "Axminster."

Second.—The production of this loom is twenty-five yards per day, at a cost for labor not exceeding two per cent. of the cost of production by the hand loom, which is a very important consideration. For the manufacture of rugs and mats this loom is equally well adapted.

Third.—By this loom any medallion design can be woven in parts, which, when united, will have the appearance of having been woven in one piece, the peculiar selvage produced in weaving in the tufts being such that, when sewed, the seams are not at all visible.

Fourth.—As the mechanism for forming and cutting the tufts is readily adjusted to any desired depth of pile, and as the strain on the material used is but nominal, there can be substituted for the fine worsted and high pile, with which the loom is now operated, worsted or woolen yarns of any quality, produeing fabrics of an inferior quality to what is usually made for "Axminster," but superior to velvets, and other cut pile fabrics, and at less cost than such fabrics can be produced by any other known method.

This invention has been secured by patents in the several countries, and a medal awarded.

Class 8. Machinery in General.

We give the general remarks of the jury on this class, in which they say: "As to new improvements, they do not display originality of invention, only improvements in details."

This was the most important class in the exhibition, and shows a greater advance than any other in the direction indicated by the jury.

The United States had 28 exhibitors, each of whom received a prize, and it was admitted that our exhibitors had more new and useful inventions than any other nation.

The following received prize medals:

1. *John F. Allen*, New York, as inventor of the slide valves, valve gear and expansive gear on Allen's horizontal non-condensing engine; exhibited by Charles F. Porter. [This was admitted as one of the most important inventions in this class.]
2. *W. D. Andrews*, New York, centrifugal pump and engines.
3. *Blake Brothers*, New Haven, Ct., stone-breaking machine.
4. *Edward Conroy*, Boston, cork-cutting machine.
5. *Capt. John Ericsson*, New York, caloric hot-air engine.
6. *A. G. Gibson*, improved carriage coupling.
7. *John C. Gove*, Jamaica Plains, Mass., belt shifter.
8. *C. L. Goddard*, New York, Meztizo burring machine.
9. *T. Hansbrow*, California, pumps. (Patent sold.)
10. *Colvin & Kershaw*, Philadelphia, cow-milking machine. (Sold, £5,000.)
11. *Lee & Larned*, New York, steam fire engine.
12. *Charles Near*, New York, self-registering dynamometer.
13. *D. Packer*, New Hampshire, washing machine, &c.
14. *Brothers Pesant*, New York, Ericsson's hot-air engine.
15. *Charles T. Porter*, Auburn, N. Y., invention of governors.
16. *C. B. Richards*, Hartford, Ct., invention of indicators.
17. *J. Ross*, New York, conical burr-stone mill.

18. *Henry Steele*, Jersey City, steam pump.
19. *S. Wilcox, Jr.*, Rhode Island, hot-air engine.
20. *R. H. Worthington*, duplex steam pump.

HONORABLE MENTIONS.

21. *C. H. Dennison*, Wilcox's hot-air engine.
22. *John Dickinson*, diamond mill dress.
23. *J. J. Eckell*, New York, combination (cotton and hay) press.
24. *A. M. Foote*, New York, lock umbrella stand.
25. *H. H. Parker*, ratchet drill.
26. *Walcott* ———, button-hole cutters.
27. *Warker & Epperstein*, Porter's mineral water apparatus.
28. *Wentworth & Jervis*, Burlington, Iowa, windmill.

In addition to these, there were quite a number of machines received after the jurors were through, which attracted much attention, and several were well sold.

The following extract from a report in the Practical Mechanics' Magazine, on *Allen's engine* in the United States division, will show how completely we triumphed in this department:

The "Allen" Horizontal and Non-condensing Engine—Exhibited by C. T. Porter, of Auburn, N. Y., at the International Exhibition, London, 1862.

This engine, exhibited in London at the exhibition, and selected to drive a portion of the machinery in the building in operation, was awarded a medal, and is thus alluded to in the record of the great exhibition:

United States.—By far the most interesting and important engine to the really instructed and mechanical engineer in the whole exhibition is, we hesitate not to affirm, that exhibited by Charles T. Porter, of New York, and named by him—after the inventor, who is said to be a working man in New York—the Allen engine. This little engine has no doubt been passed by, without regard, by tens of thousands, whose attention has been fixed by huge and splendidly finished engines not possessing a tithe of its merit. The engine is represented in elevation and plan (in the report). It is a horizontal non-condensing engine, of only eight-inch diameter cylinders, and twenty-four inches stroke. The form of the bed, which only weighs thirteen cwt., is peculiar, and, like some other parts of the engine, will not be considered graceful by most eyes. A *reason*, however, can be rendered by the maker for the form he has given to every part; and admitting, as a principle, that in machinery the most suitable is always the handsomest form, we cannot find fault with the old slewd form of bed, nor with those of some of its first moving parts. The workmanship, also, will offend the fastidious eye of many English mechanics; for, although respectable, it is not equal to English work generally; but our exhibitor informs us that it was made and shipped in New York in such haste to be in time for exhibition, that its parts were never even offered together until the engine was being erected where it now stands, in the west annexe, and where it runs at the rapid speed of 150 revolutions per minute, and gives motion to a large proportion of the weaving machinery there exhibited. It belongs to the class of variable, expansion engines; and its chief peculiarities are in the construction of the valves and valve gear, and in that of the governor, and the connection maintained between them.

This invention consists of two parts, viz: the valves and the gear by which these are operated. The valves effect two openings into one port—one past the end of the valve in the usual manner, and one through a cup formed in the face of the valve, and overhanging the opposite end of the seat. Two of these valves, rigidly connected, and giving four openings into two ports, are employed for induction at each end of the cylinder. A similar valve is employed for eduction, opening two equal passages, one over and one under the valves, for the escape of steam into one exhaust port. The great advantages gained by the use of this valve, which, by a small movement, rapidly opens and closes a very large area, are obvious. A form of the same invention, giving a double opening to valves which perform the two offices of admitting and releasing the steam, without requiring any increase in either their size or travel, is also shown in a sectional model of full size.

The report then gives a detailed account of the construction of the engine, of the governor, invented by Mr. Porter, and of an indicator, invented by C. B. Richards, of Hartford, Ct., and patented by Mr. Porter.

Medals were awarded to each of these. We allude to this engine at this time, as it was, in the language of the report, "the most interesting and important engine in the whole exhibition." This is honor sufficient, when it is recollected that the machinery department of the exhibition was the most important department of the whole; and in which England showed more advance than the other countries. We have no doubt that Mr. Porter, who understands well his business, will lay a foundation for supplying the markets of the old world, as Mr. McCormick did, in 1851, by the introduction of his American reaper.

We give a brief description of several of the machines exhibited, from the United States catalogue:

Charles T. Porter, New York city, governors for stationary and marine engines. Prize medal awarded. Mr. Porter claims peculiar advantages from the use of his governors in regulating the speed and economizing the use of steam engines. Mr. Porter offered to put in new engines, in place of most engines now in use, for what he shall effect in the economy of fuel in five years, which is a good test of his confidence in his inventions.

Sanford & Mallory, New York city, Alexander Guild, London, agent; flax and fiber dressing machines. These are among the new and important machines, and their introduction will much facilitate the production of flax, for linen fabrics, as well as open a more rapid and economic way of producing the fibers from the various southern plants. A medal was awarded to these machines.

P. H. Wemple, of Albany, N. Y., exhibited a new machine for boring slats and blinds, or any other work requiring equal spaces between the holes, and by which the distances can be varied automatically and with mathematical accuracy. Honorable mention was awarded.

George H. Sanborn, Boston, Mass., rope and cord making machine. This class of machines dispense with the common rope walk, and with great rapidity work any size or length of rope. Those on exhibition are for ordinary size of rope, and for cord for banding. Much interest has been elicited, and the jury have commended the inventor to the public. A full

description of these various machines would require too much space, but their novelty and excellence commend them to all interested.

Calvin & Goddard, New York city, Mestizo burring picker. This is one of the great improvements in cleansing wool of the burrs and foreign substances so likely to attach to wool, particularly to the Spanish and South American. A prize medal was awarded, "for originality of design, simplicity, cheapness and practical utility."

Pettee, of Philadelphia, Pa., machine for making paper bags. This machine, for its simplicity, and the wonderfully rapid and perfect manner in which it does its work, may be ranked among the most curious and interesting, as well as valuable of all the machines introduced from the United States. Its capacity is equal to the manufacture of 18,000 perfect paper bags an hour, and may be worked to 200,000 in a day. It arrived too late to be examined by the jury.

Edward Conroy, Boston, Mass., machines for cutting corks. Much is claimed for this machine, and the jury have awarded the prize medal. A good cork-cutting machine, with the vast drinking propensities of mankind, is very desirable. Surely, a machine that will reduce the expense of cutting from sixpence or eightpence per gross to twopence, will be considered a pecuniary success, and its value will be estimated accordingly, *though death lurked in every bottle* from which a cork should be withdrawn.

Joseph E. Holmes, 61 Canal street, New York city, improved swing, by which the person seated operates the swing to any desired extent.

Charles Near, New York city, self-registering dynamometer. A very accurate and ingenious instrument for the measurement of power transmitted through belts for driving machinery. This is one of those calculating instruments for making certain the amount of horse power used for any given purpose, and for any given time, that has been much sought, but which it has been thought impossible to obtain in a simple and compact form for practical use. The prize medal was awarded.

R. H. Worthington, New York city, duplex pump. Medal awarded for good arrangement, practical success, especially in fire engines. The peculiar features of this pump, which won for it the admiration of all engineers, are a new arrangement of cylinders and valve gear, by which the valve of one cylinder is worked by the piston of the other, so that one piston is always at half stroke, while the other is at full stroke, superseding and dispensing with the cumbering cranks, eccentrics and fly wheels, ordinarily used in steam pumping engines. Patents have been secured in most European States.

William D. Andrews, New York city, centrifugal pump and double cylinder oscillating engine. Mr. Andrews was the original inventor of the celebrated "Gwynn pump," so extensively used in England and on the continent; and Mr. Andrews claims many and decided advantages in his present arrangement over his original invention, which has done so much in simplifying the labor and expense of drainage and irrigation. Mr. Andrews is prepared to supply all orders for pumps of that class, and for raising 100 to 10,000 gallons of water per minute. Prize medal awarded.

Lee & Larned, of New York city, steam fire engine, for which the prize medal was awarded. This engine is made to be drawn by hand, and is

intended for the use of volunteer firemen, so that small towns and cities may avail themselves of the superior power and efficiency of steam for the extinction of fires without the expense of a horse establishment. The engine is about eight feet in length, and weighs 3,700 pounds. Having large wheels and extremely sensitive springs, it runs easier than the average of first class hand engines. The springs are flat plates of steel, of uniform thickness, but tapering in width from the middle towards either end. The steam power is derived from one of Lee & Larned's patent annular boilers, of 125 square feet of heating surface, with which steam can be raised to a working pressure in seven minutes. The pump, which is of gun metal, is Cary's patent rotary, and is driven by a single reciprocating engine of seven inches diameter, and eight and a half inch stroke, with a pair of light balance wheels to carry it over the centers. It is intended to make 300 to 400 revolutions, and will throw water over 200 feet through a one inch nozzle.

George H. Sanborn, Boston, Massachusetts, patent refrigerator, or ice safe, for cooling fruits, meats, game, poultry, butter, &c. These refrigerators, with their movable and perforated shelves, embody every advantage of the large and costly ones, and are of much greater convenience; they are constructed entirely of zinc, with a non-conducting medium all around, and when the door is closed it speedily reduces everything to a uniform temperature, very little above the freezing point. They are a great acquisition to the dining room as well as an ornament.

John C. Gore, Jamaica Plains, Massachusetts. A new method of shifting and securing belts on running machinery. The simplicity and cheapness by which a very necessary and desirable result is accomplished by this little device, has surprised every interested mechanic who examined it. The complete unanimity of the jury in awarding it the prize medal, and the universal applause of the public, betoken a sale and use of this instrument to an unparalleled extent in the history of inventions.

Charles H. Dennison exhibited Wilcox's hot-air engine, and the prize medal and honorable mention were awarded by the jury. This engine, the invention of Stephen Wilcox, Jun., of Rhode Island, combines simplicity of construction with ingenuity and efficiency. It runs at high speed, with little noise, is not liable to derangement, requires no skilled engineer to operate it, cannot possibly explode, does not increase insurance, occupies a small space, and can be applied to any purpose to which any other motor is applicable. The consumption of fuel is small, one hundred pounds being sufficient for the use of the 18-inch cylinder engines per day of ten hours. Any place sufficiently large to contain it, if in the fourth story, answers as "the engine-room." Having been in use in the United States for the two past years, it has made for itself a reputation that is valuable, and a first-rate motor where limited power is required.

Thomas Hansbrow, California, pump for various sizes. Medal awarded. This pump possesses many novel and valuable features, and among the most important, is the great simplicity of construction, whereby it is easily repaired and replaced. It has the new feature for suction pumps, that it receives the water above the chamber, and is always charged. It received much attention and commendation.

David Parker, Canterbury, New Hampshire. Large steam power washing machine. Medal awarded. This patent machine is intended for large laundries, hotels, hospitals, &c., fitted up with power, hot and cold water pipes, waste valves, &c.; the labor of washing becomes a very simple and easy process, one person easily cleansing 3,000 pieces in a day, with the least possible injury to the clothes. Furnished with a proper mangle, and rubber squeezing or wringing machine, the labors of washing are reduced to a mere nominal cost, with very little manual labor.

Ericsson, New York city, caloric or hot-air engine. A medal and honorable mention. Mr. Ericsson has attained a world-wide notoriety, in connection with his efforts to substitute heated air for steam, and in certain cases he has made it economy to use the caloric engine, particularly when small power is required, and where the expense of an engineer may be avoided.

F. E. Sickels, New York, steam steering apparatus. This invention enables one person to control the course or direction of a ship with ease. By a peculiar arrangement of the cylinders and valves of a small steam engine, the "man at the wheel," by his manipulations apparently controlling the rudder, simply opens the proper valves by which the power of the engine takes effect upon the "tiller ropes," and thus becomes the motive force, and the ship is thus held in any position desirable, as far as the strength of the apparatus will endure. Mr. Sickels received the reward of the medal for this important device.

There were three clothes wringers exhibited in the United States department; two are exhibited by George H. Sanborn & Co., and one by the World's Clothes Wringing and Drying Company. The use of rubber rollers for squeezing water from clothes after washing, has become one of the important additions to the laundry, and no washerwoman or housewife who cares for her own washing should be without them.

The clothes dryer is a most unique and valuable invention.

John Ross, New York city, Ross' conical burr-stone mill. This mill possesses the advantage of French burr-stone grinding surfaces without the great bulk and weight usually employed, thus saving a large percentage of power.

As a portable mill it is admirably adapted to the use of farmers and colonists. It makes as good flour as can be made in any other mill, which will also keep for years in any climate. Seventy-five premiums have been awarded to this mill, by various societies in the United States and Canada, and also the medal of the jury, of class 8, of the present exhibition.

Orman Coe, of Ozaukee, Wisconsin, cultivating harrow. A most valuable and ingenious device. This harrow is of the triangular form, with toothed wheels revolving on the side rods forming the frame of the harrow. It is destined to make a revolution in this class of implements.

James F. Dane & Co., Springfield, Ohio, steel plows. These tools are of beautiful construction and finish, and represent the best styles of the United States plows. The cultivation resulting from their use is equal to that of any plow anywhere in use, while the draft is one-third less than of the common English plow. Medal awarded.

Batchellor & Sons, Wallingford, Vermont. Case of implements, hay and

manure forks, hoes, rakes, etc., most beautiful and efficient tools, for which a medal was awarded. W. S. Smith & Sons, Doncaster, England, agents. No implements equal to these in all respects were exhibited.

Emery Brothers, Albany, N. Y. Cotton gin. The vast quantity and value of the cotton crop of the world, and the thousands of millions of dollars invested in lands and otherwise for its production, as well as in its manufacture, makes even the smallest improvements in its cultivation, or in the machinery requisite for its manipulation, of great importance, in proportion as they increase or cheapen its production, improve the quality or enhance its value by improved machinery used in its manipulation.

These facts are evidenced by the march of improvements since the invention and introduction of Whitney's cotton gin, which has long since completely revolutionized the whole cotton world.

They are also evidenced by the hundreds of later inventions and adoption of many and valuable improvements, while many have proved worthless or been superseded by superior and subsequent ones.

Among all the multitude of inventors, few, if any, have made any efforts to adapt the gins, in their operation, to the force by which they are to be driven, or to enable them to adapt themselves to the varying resistance offered by the different kinds, conditions and quantity of the seed cotton which is being ginned—the greater proportion of the inventions being for devices for separating the lint from the seed, without regard to the force required or the varying conditions named.

It is belived that the improvements introduced in the before named gin are of greater practical value and importance than any if not all the inventions since Whitney's invention, and now in use.

While this gin has all the material value in its parts which is to be found in others of the most approved kinds, its own peculiar construction gives to it its greatest value and importance.

(This gin arrived after the judges had made their awards. It was put in operation in the machinery department, and gave great satisfaction, and it is expected it will be introduced into the cotton cultivating districts.)

The annexed account of the machinery in the United States department is given from the London *Times:*

MACHINERY IN THE AMERICAN COURT OF THE INTERNATIONAL EXHIBITION.

That "necessity is the mother of invention" has never received a more striking illustration than is afforded by the labor-saving machinery of America. Situated far from the great labor markets of the world, the inventive genius of America has mainly directed the attention of her sons to the production of machines and implements that will enable a few to do the work of many; hence the ditch-digging machines, stone-breaking machines, and other nondescript inventions scattered throughout the American court. On passing through this court yesterday, we were accosted with, "Have you seen the cow-milker?" but having before us the "sell" lately palmed off on a contemporary respecting a "talking machine" in the Austrian department, and recollecting the painfully anxious groups that for weeks afterwards vainly rummaged that department in search of it, we had no desire to initiate a new movement in search of a second "mare's nest." Consequently, it was with some caution that we approached a

crowd in the vicinity of the United States office, and found the veritable cow-milker the center of attraction, and the entire group almost involuntarily exclaiming, "What next?" The construction of the cow-milker is very simple, consisting of two diaphragm pumps made of tin and India rubber, placed in a convenient position on one side of the pail, to which four teat cups are attached for receiving the teats of the cow. It is operated by two levers, or handles, one for each pump. One-half of the pail is covered, and the whole machine is a neat, compact affair, readily used, easily cleaned, and not liable to get out of order, nor does it require any adjusting in changing from one cow to another. It proves to be more agreeable to the cow than milking by hand, and possesses many advantages over the latter method, such as the saving of time and labor, besides being more cleanly. We would recommend the exhibitors, Messrs. Kershaw & Colvin, of Philadelphia, to take their machine to the Royal Agricultural Society's show, to be held in Battersea Park at the end of this month. The stone-breaking machine of Mr. Blake, New Haven, Conn., shown by a small working model, is designed to break stones into small fragments for road making, railway ballast, concrete, or other purposes. The stones are crushed between two iron jaws—one fixed, the other movable, and worked by a crank and powerful levers. Every revolution of the crank causes the lower end of the movable jaw to advance towards the fixed jaw about one-quarter of an inch, and return. Hence if a stone be dropped in between the convergent faces of the jaws it will be broken by the next succeeding bite; the fragments will then fall down and be broken again, and so on, until they are made small enough to pass out at the bottom. It is really astonishing to note the readiness with which the hardest stones yield to the influence of this gentle and quiet movement, and melt down into small fragments. The produce of the machine will, of course, vary considerably with the character of the stone; but a machine with jaws 10 inches by 7 inches, driven by six-horse power, and making 180 revolutions per minute, when breaking stone of a compact nature, will produce four cubic yards per hour, or a total weight of 7,000 lbs. The stones thus broken will pass through an aperture of one inch and a quarter. The machine occupies a space of about 8 feet 5 inches by 4 feet. On the Geelong and Ballarat railway in Victoria, 550,000 cubic yards of broken basalt rock were required for ballasting, and the contractors found it necessary to employ 1,500 men for this purpose. But during the progress of the work a machine similar to Blake's was introduced, and finally thirty of these machines, worked by steam power, were found to do as much as 1,000 men.

In a prominent part of this court Mr. L. A. Bigelow, of Boston, and 144 High Holborn, exhibits a series of machines for manufacturing boots and shoes. One of these machines, in presence of the jury, sewed on a sole in the most substantial manner in thirty-three seconds. A sample of the work put upon the shoes for the United States army is also shown by Mr. Bigelow. The heel-trimming machine is a very unique affair, and altogether the six machines of Mr. Bigelow are an interesting collection. One of the machines will sew on the soles of 150 pairs of boots or shoes per day. A case of American cutlery, axes, &c., exhibited by the Douglas Axe Company, of Massachusetts, is well worthy of attention; and a cotton planter, by

Messrs. Blanchard and Brown, of Dayton, Ohio, will be a subject of interest to those concerned in cotton culture in India and elsewhere. Mr. W. H. Ward, of Auburn, New York, exhibits a number of really valuable novelties in this department, among which we notice particularly his system of marine signals, especially the lights for night signals. These consist of a series of four lanterns, and each lantern is provided with powerful lenses to give range to the light, a movable red lense-envelope to color it, and a movable screen-envelope to hide it, which are operated separately or together, by means of small halyards. Mr. Ward's system embraces only white and red, which he says "are the only reliable contrasts with each other and darkness for signal purposes at night." These signals are very complete, and Mr. Ward exhibits a set belonging to the Admiralty, his system of night signals having been adopted in the Royal navy. Besides his signals, Mr. Ward exhibits a model of a self-centering turntable for railways, &c. (a working one on a large scale, manufactured by Messrs. Lloyds, Fosters & Co., of Wednesbury, can be seen at the north end of the eastern annexe); a model with truck and track of a self-adjusting carriage wheel, adapted to any curvation or line of railway, and which prevents the flange from coming in contact with the rails on sharp curves, and also a model of Tripp's dental chair, an ingenious piece of mechanism. Mr. John Ross, of New York, exhibits a burr-stone mill, which has not yet been introduced into this country. This mill consists of a solid cone runner of French burr stone, revolving on a horizontal shaft within a concave composed of burr stone, set within a cast-iron shell, the grinding surfaces being fitted to each other. It is said that a mill of this description, weighing only 450 pounds, will grind from five to six bushels of wheat or corn meal per hour, with an expenditure of less than half the power required by flat stones, for the grinding is done within six inches of the center, and there is only a small amount between the surfaces at one time. The quality of the flour is also said to be improved, for "being ground cooler, there is less loss by evaporation, the evaporation being not only a direct loss, but the cause of the perishable nature of the flour made on the old principle." Their lightness and simplicity render them eminently serviceable to farmers and others who may desire to make their own flour. Mr. John J. Eckel, of New York, exhibits a combination press and compress, for making bales and for compressing cotton, oils, tobacco, &c. The machine is worked by gearing instead of screws, the top part for making bales being geared 72 to 1, and the bottom or compress portion 600 to 1. It is stated that this press will put 1,000 pounds of cotton or like substance into 18 cubic feet. Besides the press itself, which occupies one of the corners of the American court, there is a neat plated model in a glass case, which we perceive by an engraved plate attached is to be "Presented to her Royal Majesty Queen Victoria," &c., &c. Passing into the transept from the American court, the visitor finds himself in a miniature process court, chiefly composed of sewing machines. A shield or brake attached to the driving wheel of one of Wilcox & Gibb's machines attracted our attention, and on examination we found it to consist of a very simple and ingenious arrangement for preventing the wheel from taking a backward turn. The periphery of the balance wheel acts upon an India-rubber ball, which, when

the wheel is moving in the right direction, is pushed into a recess, without impeding the motion of the wheel; but when the wheel is moved the wrong way, the ball rolls into a wedge-shaped recess, between the shield and the wheel, jamming the latter, and preventing it from turning. Wilcox & Gibb's machine has several interesting features peculiar to itself, such as that the shield or brake mentioned protects the dress of the operator from the rubbing of the balance wheel, the manner of adjusting the needle, and the apparatus for catching and looping the thread as it is passed through by the needle. This latter consists of two arms, making together a cross, at the end of a horizontal axis. As this revolves close to the needle under the cloth-plate, one of these arms, shaped like a hook, and rapidly enlarging towards its base, catches the thread, and spreads the loop, which is then brought against the axis, and next slips upon the other arm, which gives the loop a twist, and holds it. At the same time the needle goes up and comes down again through the cloth, carrying its thread through the loop already formed, when it is caught by the hook, and the first loop being released is drawn tight by the pulling of the hook in spreading the second. The twist given to the thread in forming the loop has a material effect in strengthening the hold of the thread in the cloth, thus producing a very strong and durable seam. These machines have made over 3,000 stitches a minute, and the Elm City Company, of New Haven, Connecticut, in their manufacture of tape trimmings, usually run them about 2,000 a minute. The high speeds of such fine spindles demand the very best and most limpid of lubricating oils, and the attention of engineers and oil manufacturers has been earnestly directed to this question. Mr. F. S. Pease, of Buffalo, exhibits in this court samples of lard and other oils, that seem to have all the necessary qualities. Professor Hadley, of Buffalo, says that Mr. Pease's engine and signal oil "has no acid reaction; that it stands the temperature of melted lead, 600° Fahrenheit, and even higher, without change." Mr. Upton, of the New York Central railway, states that one of his engines ran 2,059 miles, averaging 51.47 miles to the pint, which is very extraordinary, considering that on the best managed roads the miles run per pint average from fifteen to twenty. The Mechanics' Magazine says, "His (Mr. Pease's) engine and machine oil is equal to sperm, and much cheaper; it stands a greater degree of heat, and a greater degree of cold, than sperm oil, and does not consume so fast." Altogether, Mr. Pease's samples of oils are an interesting collection.

Missing Wilcox's hot-air engine from this department, we were inclined to think that the commissioners had relaxed the rule that requires that all goods placed on exhibition shall remain till the exhibition closes; but on inquiry we found it had been removed in order that the jury might see it in operation, as no fire is allowed within the building. It is now at No. 4 Cromwell lane, where it will likely remain for some time, and where it can be seen working any day from two to four P. M. Several new and interesting machines are still arriving from America and being placed in this court, among which we notice a rope-making and cork-cutting machine, and also some Shaker washing machines, manufactured by the United Society of Shakers, at Shaker village, New Hampshire.

At a subsequent date the following notice appeared in the *Times:*

The North American court, curtailed in its proportions as it has been by the unhappy state of the country, contains, nevertheless, a *larger proportional amount of ingenuity and novelty than perhaps any other department of the exhibition.* We have already alluded to the most remarkable of these Yankee notions, not forgetting the cow-milking machine, which is at present one of the most attractive objects in the building, as constant a crowd being assembled round it as gathers about the glittering show cases of Messrs. Garrard or Emmanuel. One or two additions have recently been made to these examples of the acuteness and mechanical ingenuity of our cousins. One of them is a machine for making paper bags. A continuous sheet of brown paper at one end is drawn into a system of cylinders, from which it emerges cut and pasted into a series of square bags. One of these machines will produce on an average 220,000 bags per day of ten working hours, and with two machines as many as fourteen different sizes can be manufactured. There is also an American washing machine, in which the dirty linen, which is put in at one end, comes out washed, dried, and ironed at the other. This remarkable domestic auxiliary, not being shown in operation, it is impossible to do more than refer to the authority of the manufacturers, who, with truly national acuteness, combine benevolence with business, by advertising that they will contribute to the Lancashire distress fund 10s. for every machine which is ordered of them. Another recent addition to the American court is a portable corn-mill, to be worked by hand, or by horse or steam power, the peculiarity of which is that one stone of a conical form is made to fit into the other, which is concave. The advantages claimed by this arrangement are a saving of power and the preservation of the natural qualities of the flour. By adjusting the grinding surfaces in a different manner the mill may be used to grind any other substances—such as paints, coffee, spices, drugs, &c. A prize medal has been awarded to this ingenious modification of a very ancient piece of mechanism.

An American Lady's Visit to the Exhibition.

BY MARGARET BLOUNT.

We give extracts from this very entertaining article, which will prove interesting to those who desire a view of the exhibition, given in a manner which cannot but be gratifying to every reader:

I went at last to the exhibition, and under the most favorable circumstances imaginable. It was a bright, sunshiny day. I had a pleasant companion; there were happy faces, cheerful voices on every side. It would have been a shame not to enjoy the trip and everything connected with it. Even the cabman took his proper fare with quiet civility; and after some good-natured pushing and crowding at the turnstiles, (how tired those poor attendants must get of fresh arrivals!) we found ourselves within the building.

The first thing we did was to seek out the beautiful Majolica fountain, whose guardian saint overlooking the nave is seen to the best advantage through his silvery veil of spray. The waters of this fountain are said to

be perfumed by Monsieur Rimmel—and certainly a most delicious fragrance greets you as you approach the place; but I saw many ladies dipping their handkerchiefs in the basin, and I fancy they fared no better than myself, if I may judge by the blank looks they gave each other as they walked away. But the perfume is certainly there, if one knew exactly how to make the subtle guest a prisoner.

Looking from the fountain down the nave, I got my first and best view of the exhibition. A dazzling view of flags, statues, trophies, guns, telescopes, moying colors and moving people, that made me draw a long quick breath, and hesitate for an instant before I plunged into the kaleidoscopic sea. At last we went down the steps (by the side of which stands a crystal lamp, exhibited by F. and C. Osler, which would do admirably for the grand hall of a modern Aladdin's palace) and began our journey through the nave.

Following out this plan to which I have alluded, we did not attempt to visit the departments by rule and order, but wandered to the east or the west, as some new beauty caught our eyes.

As I had never seen the "Koh-i-noor," we walked towards the South Court, and found the precious jewel flashing its rays upon the stall of Messrs. R. and S. Garrard & Co., guarded by a courteous policeman, and further protected from its too ardent worshippers by a railing of crimson cords within which you are expected to enter, and, having gazed yourself off your feet, make room for your eager neighbors. Messrs. Garrard & Co. also exhibit an ornament for the center of the table (belonging to the Queen), in the style of the Palace of the Alhambra, with a group of horses at the base, all portraits of Her Majesty's favorite steeds; a jeweled and enameled cup presented by Her Majesty and the Prince Consort to the infant Prince of Prussia at his christening; and two other christening cups, presented by Her Majesty to the Hereditary Duke of Baden and the daughter of His Excellency Count Bernsdoff. From this place we went to Mr. Elkington's stand, where we found a splendid service of plate, made for the Duke of Barbant, for 100 persons—a group of Guy, Earl of Warwick and the famous Dun Cow—and a group of horses from the celebrated picture by Rosa Bonheur. Mr. Angell, of the Strand, also makes a fine display of silver ware. Messrs. Hunt and Roskell exhibit the Cooper testimonial, the Elphinstone testimonial, the Goodwood cup and some magnificent lamps belonging to the Earl of Dudley. The finest thing in this case is the group of fighting stags. In the Prussian department are exhibited (in silver) the baptism of Christ, and the splendid wedding present given by the city of Berlin to the Crown Prince and Princess. In Mr. Emmanuel's case there are two groups of figures beside a rustic stile, which tell their own tale so prettily that I will only recommend my friends to go and look at them. Mr. Hancock exhibits the Burns, Shakspeare and Milton memorials. Messrs. Smith and Nicholson display some of the most beautiful testimonials in the building. Among these may be mentioned one given to Alderman Mechi by 430 of his agricultural friends, one presented to Sir Moses and Lady Montefiore by His Highness Tousson Pacha, and one given to the Distillers' Company by Joseph Boord, Esq. But the two gems of the collection are the model of the "Fox" steamer, presented by Lady

Franklin to Captain Sir Leopold McClintock, and the testimonial presented to James Allan, Esq., by the employés of the Peninsular and Oriental Company, consisting of a magnificent center-piece and an entire dinner service. The center-piece is surmounted by a silver globe, on the top of which stands a little "Jack Tar" holding the company's flag. The side pieces, which form either vases or lamps, are beautifully engraved with representations of the principal ports at which the company's vessels call, such as Gibraltar, Aden, Calcutta, Hong Kong, Sydney, &c.

By way of finishing the examination of silver, we entered the French court to look at the magnificent plateau designed for the great banquets at the Hotel de Ville Paris. Only the center-piece is exhibited, but this alone occupies the longest dining-table I ever saw. It is a barge, placed upon a base of plate-glass, having upon its deck a beautiful female figure, emblematical of the city of Paris, and supported by Caryatides, representing Science, Art, Industry and Commerce. At the bow is an eagle; Prudence, surrounded by mermaids and tritons, holds the helm, and the Genius of Progress lights the beautiful vessel's course. This splendid display of our courteous neighbors draws crowds from all directions, and it is almost impossible to get near enough to see it well. The French court is of course full of elegant and beautiful things, which cannot be described in this small space. Through the kindness of two lady friends who took compassion on my ignorance, I am enabled to state positively that the display of bonnets, mantles, gloves, plumes, artificial flowers, silks, satins and velvets in this department are magnificent beyond belief. I gazed at the cases respectfully from a distance, for, I am sorry to say, that in this, which should of right be my legitimate field of research, I am as helpless and as stupid as any masculine visitor could possibly be. I generally know a bonnet when I see it, and I have a vague idea that blue and red are two colors that do not blend well together in a lady's dress. Beyond this I do not profess to go, and must be excused from entering into the details of the wonderful structures I noticed in the case of "Fashions." I was particularly requested to observe some laces and some embroidery—the one looked to me like the most beautiful drawings on spiders' webs—the other made my eyes ache at the mere thought of the work expended upon it. Everything of this kind from France is always beautiful; but as for the Empress's handkerchiefs, if it had not been for my better informed guide, I should have committed some terrific blunder in describing them. Titania might have had some like them, and perhaps Cleopatra wiped her lips with one of the set after dissolving her famous pearl; but humble people like myself can only look from a very long distance at such marvels in matters of the toilet. In this department ladies will find one great curiosity—a cushion, apparently stamped with the Royal Arms of England. It is really done by hand, and is worked with the finest cotton, and is shaded as exquisitely as the finest engraving could be.

Crossing the nave again, we lingered longingly over the Russian department, with its wonders of jaspers and malachite, and its exquisitely painted vases and cabinets; glanced at the arms and furniture of Turkey and Italy; at the anchors, granite pillars, block of silica and sledge of Norway; took a minute's view of the granite monuments, the guns and anchors of Sweden;

coveted the King of Denmark's magnificent dinner service, the carved woods of Switzerland, the diamonds and silver of Holland, the Belgian tapestries and carriages; and then sought out the porcelain services, for which I confess I have a decided weakness. There are three veiled female heads, by the way, in the royal porcelain works, which should not be overlooked. Here we saw Her Majesty's porcelain service, manufactured at Worcester; then the Staffordshire ware, with designs by Phiz; Mr. Copeland's beautiful services, from which it would seem almost a sin to eat, and the Wedgewood ware, each piece of which is a painted poem in itself. In this department I came upon some of the pretticst things I ever saw; Messrs. Dobson and Pearce's prize flower glasses, which received the first special award from the Royal Horticultural Society in 1861—most deservedly I am sure—for anything more charming than those cool vases of ferns, water lilies and deep blue flowers, those clusters of roses lifted on high, their crystal supports, entwined with buds and leaves, cannot well be imagined. Opposite this stand are Pellatt & Co.'s beautiful dessert services filled with wax fruit, that looks almost too tempting when one is hot, hungry and tired.

Wandering on, we came upon the Greek department, with its splendid costumes and life-size figures arrayed therein. From there we went to inspect the Japanese inlaid and lacquered cabinets. I looked in all directions for that "common tea-cup," placed in the post of honor, which so tickled the fancy of one of the Japanese ambassadors that he exploded into a tremendous laugh at the sight, but I could not identify it. The display of silk cocoons here is very interesting. China sends ivory vases carved like lace, needlework, ivory baskets, jade stone idols and monsters, and some interesting curiosities from the famous summer palace, among which are a carved screen that stood behind the Emperor's chair, a human skull mounted in fine gold, and, what was of great interest to me as a scribbler, the imperial seal of the Emperor.

This seal was found in the Emperor's room on the taking of his summer palace by the allied forces.

It is made of jade stone, or jasper (as it is called here), and is used for stamping all the first class diplomas of literature throughout the empire. Its yellow tassels, &c., are proofs of its being the imperial seal, and it has been lent to the commissioners by its present owner, J. A. Olding, Esq., of the Peninsular and Oriental Steam Navigation Company. It may be looked upon as one of the best and most original specimens of Eastern curiosities.

From this department we made our way to the Roman court. It is useless attempting to speak of its beauties in this short space; but in some future number of *Saturday Night* I hope to describe it, and the famous tinted Venus of Gibson, and other statues which stand in the Italian court. Here may be seen the great carriage mounted in solid silver. It is not so beautiful, however, to my taste, as the King of Prussia's carriage in the opposite part of the building. Mr. Benson's great clock is near this court, and attracts numerous gazers. Here, too, in a conspicuous position, is the statue of a great Newfoundland dog, "Cabot" by name, whose dear old head I should like to pat, whose honest paw I should feel proud

to shake. At the foot of the statue, when I was there, sat a pretty little black and white living dog, with a collar round his neck, marked with a number and this legend:

"I am the policeman's dog, 'tis true,
Pray tell me, sir, whose dog are you."

So I shook hands with the "policeman's dog," instead of Cabot, and charged him with my compliments and thanks to the whole staff in the building, for the kind and courteous service they had rendered me that day in my wanderings to and fro.

Passing up through the court, I found a little out-of-the-way nook, in (I believe) the Belgian department, where the skeletons of all sorts of reptiles, the nerves and blood-vessels of the human face, the bones of the ear, &c., are preserved in the most curious manner. A visit to this department will repay those interested in such matters.

No visitor should neglect the English carvings in wood. These will be found chiefly in the furniture department. There are many sideboards exquisitely decorated with groups of dogs, boars, and dead game; but the gem of the whole collection, at least to my unaccustomed eye, is the Robinson Crusoe sideboard. Perhaps I like it for the story it tells. At all events, it should be seen. I am sure the man who carved it pored over that book, hour after hour, in the winter evenings, when he was a boy, and longed to go to sea and get wrecked upon a desert island, as Robinson did, else he could never have worked out all those minor details, even down to the little cat's head peering from a barrel in the shipwreck (for which children fresh from the tale will especially look), with such a careful eye and loving hand.

When you are in this department you will see crowds rushing in one direction, and, following naturally in their wake, will very likely see, as I saw, only a very good-tempered policeman, who dismisses the gazers with a pleasant, "Now you have all seen the bird, move on, please." Yes, this is the wonderful bird from Regent street, who springs up from a small enameled box, shakes his wings, opens his beak, sings like a nightingale, and then disappears suddenly, as if he had been shot. He has a neighbor and rival a few steps further down the nave. Here stands a silver casket, which also forms a clock, watched over by a very courteous and obliging young gentleman, who is always ready to answer the questions of the admiring crowd that overrun his stand during every half hour in the day. His bird also springs up suddenly from some cunning hiding place, spreads his wings, moves his eyes, and sings away, as though his heart was in his little beak. A silver shepherd, who surmounts the clock, pipe in hand, listens with mute wonder. The bird stops, gives his wings a shake, and cocks his eye at him, as if he was saying, "What do you think of that, my boy?" The shepherd raises his pipe to his lips, moves his little silver fingers, and plays the tune. The bird listens, gives his saucy little head a toss, that certainly means "Fiddle-de-dee! you think you can imitate me, do you? Now just hear this," and away he goes again, trilling and warbling like a feathered sprite. Again he stops and listens—again the shepherd plays, and so the pretty game goes on; when, from underneath the shepherd's feet, a striped and treacherous cat steals out, makes a sudden

spring, and down goes the little lid, and the bird has vanished! I hope he is not eaten.

But how on earth is one to help coveting his neighbors' goods in the great exhibition? I freely confess that I am often guilty of that crime, and if I could quietly pocket those two beautiful birds, a magnificent painted casket in the Russian department, some carved baskets, assailed by wicked little wooden mice, in the Swiss stalls, and several other things that I could mention, I am almost afraid that I should walk off with them incontinently. But, luckily, I have the fear of policemen, draped, like statues in green baize, before my eyes, and so refrain.

We walked through one or two of the galleries, in order to get a view of the Horticultural Gardens, and thus we saw the carved piano and other work from Madras; some beautiful saddles for camels; the famous Robin Hood window, and the east window of Doncaster church. Coming back, we chanced upon some novelties at the stand of Messrs. Negretti & Zambra, which are worthy of notice. By the kindness of the gentleman in charge, I was enabled to examine some of them minutely. They exhibit in class 14, photographic apparatus, stereoscope lenses, and an interesting collection of stereoscopic pictures, taken by their own artists in various parts of the globe. They are the only exhibitors of transparent albumen pictures in the British portion of the exhibition.

In class thirteen they exhibit a most interesting collection of meteorological and philosophical instruments. Many of the meteorological instruments are of entirely new construction, five different patents having been taken out by them for new inventions since 1852, whilst their improvements in the instruments in use embrace maximum and minimum thermometers, standard and traveling barometers, aneroid barometers for the pocket, smaller than a common watch, anemometers, rain gauges, etc.; in fact, no instrument connected with meteorology susceptible of improvement has been overlooked by them. They also exhibit about the only novelty in the exhibition in connection with field and opera glasses, they having substituted rock crystal lenses instead of the common glass ones, insuring by this change greater amount of light, and less liability to scratching or dulling by continual cleaning of the lenses.

Those of my readers who have visited the familiar and favorite stall of Messrs. Negretti & Zambra, in the Crystal Palace, will doubtless feel glad to know where to look for its fellow in the great exhibition.

With some difficulty we made our way to the western annexe, which is entirely devoted to machinery. This is one of the most interesting and instructive parts of the building. Among other wonderful inventions I found here Dr. Normandy's apparatus for distilling salt water into fresh.

During a voyage to Egypt, which I made this spring, I had an opportunity of drinking this water, on board the Peninsular and Oriental steamers—the "Valetta" and the "Ellora;" and thinking the apparatus might interest my readers, I procured sufficient information from the attendant to enable me, I hope, to describe it without any glaring blunder.

It was fresh and pure as if it came from a mountain spring. In fact, I found no water abroad which would compare with it, except the far famed "sweet waters of the Nile." It is equally applicable for steamships, sail-

ing ships, or on land, and will convert sea, or any impure water, into fresh and wholesome water, equal to that of the best springs. Its advantages over all other machines hitherto used are that it requires only half the fuel, that it renders tanks unnecessary, and that, being aerated and perfectly cool, is fit to drink the moment it is produced; whereas, ordinary distilled water is hot when produced, and must have tanks provided to cool and aerate it, which often takes several days. In emigrant ships frequently 150 tons less water is taken, which not only permits the owners to avail themselves of that extra space for cargo, but saves them the expense of the water casks and water which would otherwise be required, and which would be considerable; moreover, the emigrants are provided with a water infinitely superior to that supplied in casks, which latter has to be used for washing and cooking purposes—the passengers invariably declining to drink it when Dr. Normandy's machines are in the ships.

The merits of this aerated water have now been so clearly proved that it is in very general use in the Peninsular and Oriental Company's steamers, as well as in others. Emigrant ships are not permitted to sail without it.

It is well known in Her Majesty's navy, that fever has been conveyed from one ship to another, by the water distilled for the supply of the fleet having imbibed its air from the hold of a ship where fever was raging. With this apparatus such a fearful calamity would be impossible, as the water is fully charged with air before it enters the tanks.

From the western annexe we went where my heart had gone long before me, and passing under the shadow of the eagle, and the stars and stripes, I found myself *at home*, even in a foreign land—since American faces were around me, American hands grasping mine, and American voices sounding in my ear.

In this court is exhibited machinery not requiring motive power—such as models and contrivances of a utilitarian character. In front is an area for sewing machines and articles of ornament and luxury, and a fine-art area and court, which, as far as the nature of the space and walls permitted, have been fitted up in a chaste and elegant manner under the superintendence of Mr. J. F. Cropsey. Over the arches at each end of the inner court are placed American flags, which were kindly loaned to the United States department by Sewell H. Warner, Esq., 108 Minories. The inner or utilitarian court has also been decorated by Mr. Cropsey, in a simple and graceful style.

In attempting a description of articles in the United States department, we will commence with the first number in the catalogue.

Number one is a magnificent collection of American minerals, containing over one thousand specimens contributed by Dr. J. W. Feuchtwanger, of New York.

Next in order in the catalogue is a cabinet of minerals from Lake Superior, containing choice specimens of copper ores, silver and copper ores combined, quartz crystal, etc.

Specimens of zinc ores, with their products. Pig and bar iron, and steel, from the New Jersey Zinc Company, Newark, are the next in course.

F. S. Pease, Buffalo, N. Y., presents some elegant specimens of oils—whale oil, lard oil, and rock oil, in its crude and manufactured state.

From M. H. Bagley, New York city, specimens of crystal carbon oil for lamps, which are as transparent as spring water, non-explosive, and can, it is said, be manufactured very cheaply.

From Lyons, N. Y., we have specimens of essence of peppermint, spearmint, wintergreen, etc., which can be laid down in London at one-fourth the price charged there for articles of the same quality. They are contributed by the manufacturer, Mr. A. Hall.

A large collection of native roots and drugs, contributed by E. Parish, for the College of Pharmacy, Philadelphia, in which are specimens of nearly all medicinal roots, drugs and herbs to be found in the United States.

Passing onward we find samples of cereals, clover, timothy seed, peas, beans, etc., from O. Howland, Auburn, N. Y. Then we have samples of flour, from Hecker & Bros., New York city, and Stebbings & Co., Rochester, N. Y.; salt from the Onondaga Salt Company, Syracuse, N. Y.; maizena from the Glen Cove Starch Company, Long Island, N. Y.; samples of Indian corn in the ear, from John Waddell, Springfield, Ohio; and samples of starch from the Glen Cove Starch Company.

As we move on, we find in class five an ingenious and useful invention, a lock, nut and ratchet washer, giving to nuts and bolts the firmness and safety of rivets, exhibited by Lawrence & White, Melrose, N. Y. From the Rogers' Locomotive Works, Patterson, New Jersey, we have lithographs and photographs of locomotives, which are most admirably executed.

In class six are two American carriages which attract much attention; one, a road buggy, astonishes the natives for its lightness and elegance of finish; the other, a phæton, is equally elegant and light. These carriages were sent by Brewster & Co., New York city. Blanchard & Brown, Dayton, Ohio, have on view a case of buggy and wagon spokes, turned out by machinery.

Passing on to class seven, we find a great variety of those useful and wonderful sewing machines. Had the United States department nothing else than the sewing machines on exhibition, their department would be one of the most interesting in the building.

The ladies, in passing through this portion of the exhibition, devote considerable time, and manifest much interest in witnessing the manipulations of the operators.

The Japanese Ambassadors, in their visit to the United States department, a few days since, were much interested in these busy little implements, and said that they were in use in Japan, and that the Tyconess of Japan was a skillful operator.

The exhibitors of sewing machines are Wheeler & Wilson, New York, and 139 Regent street, London; I. M. Singer & Co., New York, and 72 Cornhill, London; the Howe Machine Company, New York, and 8 Ludgate street, St. Paul's, London; Wilcox & Gibbs, New York, and 1 Ludgate Hill, London.

There is also a sewing machine for sewing boots and shoes, invented by Charles R. Goodwin, and exhibited by L. A. Bigelow, Boston, Massachusetts.

Continuing our investigations, we come to class eight; this, with class nine, contains the real strength of the United States department.

The first article in class eight is a power loom for weaving tufted pile

fabrics, exhibited by A. Smith, West Farms, N. Y. This machine is nearly ready for exhibition in the machinery annexe, and when running we shall give it a more particular notice.

R. H. Worthington and Wellington Lee, of New York, have in the machinery department a duplex pump, which is spoken of as an admirable invention. There are also, in the same department, a stationary engine, and governors for engines, which are mentioned in terms of admiration; these are exhibited by Charles T. Porter, New York city.

W. D. Andrews, New York, exhibits in the machinery department a centrifugal pump and oscillating engines.

Many distinguished visitors have admired these ingenious inventions, among whom we may cite the Crown Prince of Prussia, Prince Oscar of Sweden, and the Japanese.

For want of space in the machinery department to enable the exhibitor to show in motion Wilcox's hot-air engine, it is shown in the principal area. This machine would be a great attraction, could it be seen running. It is exhibited by C. H. Dennison, Rhode Island. George H. Sanborn, Boston, Mass., has contributed a refrigerator and ice-water tank combined—simple in its construction, ornamental in appearance, and useful for every family.

A combination press and compress, invented and exhibited by J. J. Eckell, New York, has some valuable improvements over other presses now in use; there is a full sized press, and also a superb working model most elegantly finished.

From the far-off golden land, California, are double-acting force pumps, invented and exhibited by Mr. Thos. Hansbrow, Sacramento. The exhibitor has, in addition to a working pump, a most exquisitely finished full-sized pump, richly ornamented in silver, with the coat-of-arms of California.

One of the most ingenious and useful machines in the United States department is a newspaper-addressing machine for printing the addresses of papers on the wrappers. By a simple and rapid process the names are cut in blocks, then placed on a tape, inked, and the addresses printed much faster than they can be written. This machine is to be found in almost all the large newspaper offices in the United States, and will doubtless come into use here.

Near the entrance of this department the visitor will notice a neatly-constructed model wooden house, which is used as an office. Within is kept a registry of all Americans who visit the exhibition, and who desire to leave their addresses; also a registry of everything on exhibition in this department. If the article or the patent under which it is manufactured be for sale, the fact may be ascertained by inquiry at the office.

After looking at these, the visitor should not fail to visit the wonderful cow-milker, exhibited by Messrs. Kershaw & Colvin, Philadelphia. In the fine-art court there are some superb paintings, among which are "Autumn on the Hudson," and a "Cane Brake" by J. F. Cropsey, Esq; "Bath Scene," "Flower of the Seraglio," and two portraits by M. K. Kellogg, Esq.; engravings of "Cole's Voyage of Life," portraits of the "Mother of Washington" and "Daniel Webster;" specimens of American bank notes; a splendid painting by Glass, entitled "The Night March;" also a fine statue of

America by E. Kuntze; American books contributed by Henry Stevens, Esq., 4 Trafalgar Square, and by Samson Low, Son & Co., Ludgate Hill.

In this court are several magnificent pianos, exhibited by Steinway & Sons, Mr. G. Hulskamp, and Mr. Ducker, New York. These pianos have attracted a great deal of notice, and in tone, finish and elegance are pronounced by competent judges superior to any instruments in the exhibition.

Here also are some beautiful specimens of landscape painting in real flowers, the colors of which are preserved as brightly as in life. Lady visitors will be especially delighted with these little gems. They are the work of an American lady, Miss F. Macdaniel.

By the time we had gone through this department I was nearly tired out, and could take only a hurried glance at the wonderful picture gallery, to which one ought to devote days, instead of hours. After staying some time in the exhibition (especially if you have the misfortune to be as I was that day) a "chiel takin' notes," you feel, as my countrymen graphically say, "like a fly in a drum"—and are not very well qualified to pronounce upon the merits of a painting. But to me, fatigued though I was, everything in that gallery was a dream of beauty. I sought out my favorite, Sir Edwin Landseer, first, because I love animals so passionately, that in my eyes he is the crowned king of all painters. Then I looked for Mr. Herbert's beautiful Venetian pictures, and Holman Hunt's "Light of the World," and went away haunted in the oddest manner by three utterly different pictures, of which I had caught only a glimpse in passing, "A Corn Field in Surrey," "Murder, Fire and Thieves," by Mr. Corbould, and the little "Wanderer Returned." Why those three pictures among so many gems of painting should have stamped themselves so obstinately on my brain I cannot say, but my companion, who had been a sailor, seemed equally beset with the famous "Luff Boy," and could talk of nothing else all the way back to the refreshment rooms of Mr. Morrish, where by this time we were very glad to go, and where we were served by the most courteous of attendants with a dinner fit for a prince, at a very moderate charge.

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I have been but twice to the exhibition, and my last visit was on a shilling day—the people's day. Hundreds of sensible looking mechanics, with their wives and children, thronged the building, and it was a perfect treat to see them in the western annexe among the steam engines, hydraulic pumps, &c., explaining the different parts of the machines, pointing out their wheels, and patting the iron monsters upon their heads and backs as if they had been living animals. Coming up the nave from thence, I fell in with a party of pretty little girls from the London Orphan Asylum, who were sent to the exhibition by the generosity of some of the leading members of the Stock Exchange. The boys are to have a similar treat this week. I am sure the business affairs of those kind hearted men will be none the less prosperous because of the pleasure they gave to these little ones—and I wish with all my heart they could have seen them as I did, sitting on the steps of the daïs, singing with their sweet treble voices something of which the chorus only reached me—"Glory—glory—glory!" The band of the Distin Brothers began to play, and the children were silent, listening to the

exquisite melody with round faces and rounder eyes. Ah, gentlemen of the Stock Exchange, little kindnesses like these are like the "cup of cold water," which One who was all kindness said, should never go without its reward.

Leaving the children still listening to the band, I wandered on, and losing myself in the French court, I saw a party of gentlemen who stood talking together beside the knight in armor. I knew but one among them. I only knew him by sight—but the first glance at the fine portly figure, and the energetic thoughtful face, took me far away from England to a land, and a morning excursion of which I had not thought for many a day—an excursion made with a motley party of Americans, Frenchmen, Englishmen, Spaniards, Germans, Arabs, and Nubians, all bound to the pyramids together. It was a journey which could never be quite forgotten. The brilliant colors of the Arab dresses contrasted finely with the more sober hues of the English garb; and each figure, as it disappeared beneath the bending palms, became invested with a romantic grace, which was not so much, perhaps, in itself, as in the scene around. At a short distance on my right lay the "sweet waters of the Nile;" on my left a bean field, in full blossom, perfumed the warm air with a breath of home; behind me lay the Arab town we had just left; before me rose the solemn pyramids; and over all was a sky so blue and a sun so bright that it was joy enough to live and look upon them—one needed nothing more!

I followed the party at a slower pace, like one in a dream. Here and there, as I wound along the road, shapes most familiar to my earliest years started into life and motion before me. "Yusef, the water carrier," passed me twice that morning, and saluted me courteously, with hand laid upon heart and head. I saw "Ali Baba" in the blue distance, driving his ass before him, laden with faggots, and I knew that he had but just left the robbers' cave, and that beneath his wood, had I time to examine it, I should find many a jar of gold. "Aladdin" and his pretended uncle sat by the wayside, eating their dinner of bread and dates. The boy looked up at me with his bright eastern face and smiled, but the old magician turned sourly away, and muttered something about "christian dogs," as if he knew that I had penetrated his disguise. Far off, across the Nile, rose the pinnacles of "Haroun Alraschid's" summer palace, with its gardens, its gilded kiosks, and painted pavilions, and its little gates, where he and "Giaffar" were wont to let themselves out by night to walk the streets of the city. I knew it all—the place, the people, the date trees over my head, the patient camels marching by in Indian file, the veiled women, the turbaned men, the wide sandy desert, the Bedouin tents, and the distant pyramids—were they not all part and parcel of my infancy? To come in sight of them, on that bright eastern day, was neither new nor strange to me. It was simply a dream made real—a dream almost as dreamlike still.

And two days afterwards, as we returned from Suez to Cairo, our train was stopped at some station with an unpronouncéable name in the delta of the Nile, and we were kept there two mortal hours, while another and a very richly-decorated train got under way. I spent much of that time in watching the movements of a dignified-looking man in the white military dress of the country, whose path no one ventured to cross, and who was

conversing affably with three or four aged men, who wore the most beautiful Eastern costume I had ever seen. They looked like the patriarchs of the Bible to my delighted eyes; and when the hour of noon came, their attendants spread rich carpets upon the desert sand, and they knelt and prayed, regardless of the curious strangers all around. The bright blue of the noon sky, the crowd at the lonely desert station, the prancing horses, the handsome, stately Arab men, the veiled dark-eyed women, the beautiful stone bridge over the more beautiful Nile, and that white clad figure attended by the dignitaries of the land—how it all rose suddenly before me like a picture! For he who had worn the white military dress on that day was again before me—it was His Highness Mohamed Said Pacha, the Viceroy of Egypt, upon whom I looked!

And still the surprises were not all over. Ten minutes afterwards I stood in the nave, watching a poor, bewildered old soul, whose bent bonnet and faded gown told how valuable shillings were to her, and who wandered to and fro alone among pictures, statues, Armstrong guns, and trophies, with a pleased, yet puzzled look, that was pathetic enough. I was watching her dumb, untaught efforts to comprehend all she saw, and considering whether it would be correct to go and offer myself as her Cicerone, when an American, who stood near me, touched my arm, and said, indicating the gallery just above and before us, "Look there!" I looked, and saw a fair-haired young man, a young lady with a sweet, serious face, and a pretty girl, still younger, while a little in the background were two or three ladies and gentlemen apparently in attendance. It was the Prince of Wales, Princess Alice, and Princess Helena.

"A shilling day!" exclaimed my American friend. "Now, that is what I like! I never felt proud of seeing a prince before; but I do now, and I could go up and shake that young gentleman by the hand, and take off my hat to his sisters—the hat of my heart, as well as the hat on my head—for showing that they are not afraid to mix with the people at such a time as this. That is the sort of royalty I can understand!" and he walked away towards his own department, positively humming the National Anthem as he went.

And he was right. A year ago the Queen of England paid a most delicate compliment to my own dear country—a compliment which will never be forgotten or undervalued by any American. She sent her eldest son among us, and the heart of the nation rose up and welcomed him as its own son; not so much because he was a prince, as that he was the child of a great and good woman.

"So for the Mother's sake the Child was dear,
And dearer was the Mother for the Child."

The name of Victoria was loved by Americans long ago—the name of Albert Edward has now become, like hers, a household word in many a northern home. And when the war is over, let but the Sailor Prince follow in his brother's footsteps and share his welcome. These kindly courtesies do so much to bind the two countries to each other. The Queen may make treaties and sign contracts which please and profit us, but when the mother entrusts us with her children, she takes our very hearts by storm.

And as in America last year, so at the exhibition during this. I am sure

that there was not a poor artisan or laborer in the building who did not feel it a personal compliment that the Prince and Princesses were there on *their* day. Even the good old soul, of whom I have already spoken, had been informed of their presence, and when I passed her again, and found her looking, with her heart in her eyes, at the kind young faces that did not turn away from her gaze, I stopped beside her and said:

"I am an American, and almost a stranger here. Can you tell me who those young ladies are?"

She dropped her humble courtsey, (I know not why, but that token of respect from the poor and the aged always gives me pain,) and answered, with a look of pride and pleasure that was beautiful to see—

"Oh, yes! It is the two Princesses; and that is the Prince of Wales—*our* Prince—God bless him! And only to think of their coming on the shilling day!"

I went away quite consoled about her. However puzzling the exhibition might be, it gave her one sight which her simple loyal soul could well understand, and which made her happy for the day. I went up to the picture gallery for the purpose of comparing the faces I had seen with the portraits there. And standing before that pretty picture of the Queen, with one child in her arms and another half hiding his golden head within the folds of her dress, my eyes wandered to another painting close at hand, the picture of two princely brothers, one of whom has gone from among us forever. As I gazed at the beautiful, serious face of the student, a half forgotten incident came to my mind which occurred the first time I saw the Prince Consort. It was in 1857. I had just arrived in England, and was of course most anxious to see the Queen. A young lady friend of mine, knowing this, dashed into my Brompton lodgings one afternoon, breathlessly exclaiming: "The Queen and Prince Albert are just coming from the Kensington Museum—you never will have a better chance of seeing them." I started up, caught my bonnet, and ran up the avenue to Brompton Church, fully expecting to see crowns and scepters, Life Guards and gold sticks in waiting. Lo, in their place came a plain dark brougham, drawn by bay horses, and guarded only by two most pacific looking footmen in drab liveries. At that time rank republicanism was uppermost in my mind. I had no faith in thrones, and was possessed with the comfortable idea, which had been instilled into my mind from infancy, that an American was quite as good as anybody else, if not considerably better. Accordingly, I was determined to take a good look at royalty, because it was my pleasure so to do; and standing on the curbstone, with my eyeglass raised, and my head close to the carriage window, I prepared to satisfy my curiosity.

The Prince Consort sat nearest me, but instead of resenting my somewhat impertinent approach, or smiling at the ludicrous figure I must have cut, he graciously bent his head and drew back, thus allowing me to gaze full in the face of a fine, thoughtful looking lady, who also pardoned my rudeness by a slight bow. Down went my glass, and into my eyes came tears; I knew not why, nor do I know to this day. But the perfect courtesy and kindly good will of the Royal Couple charmed me so, that, New Englander though I was, I was ready at that moment to throw my

bonnet in the air, and cry "Long live the Queen," with all my heart. Had I been born a subject of that gracious lady, I doubt if she ever would have found a more faithful or enthusiastic one—one more ready to serve her "to the last gasp, with love and loyalty!"

As I thought of that pleasant little incident—so long—so long ago, another vision rose before my eyes. A vision of a cold, damp, wintry day, when the sky was gloomy, when the church bells tolled, when England mourned, and even my heart, the heart of a stranger to the people and their dead, felt heavy, as if it had suffered some grievous, some personal loss. I remembered how the city and the suburbs were stamped with the seal of woe; how signs of mourning met the eye on every side, even to the closed shutters of the shops, and the crape rosettes upon the omnibus drivers' whips. I seemed to see a Royal chapel and a Royal bier far away from that mourning city. A sad procession forming around an open vault—a fair-haired young man, and a pretty boy who clung to him, weeping bitterly, as his father's coffin went slowly, slowly down, while from the choir those sublimest words came softly on the air:

"And so to Jesus Christ I'll go,
My longing arms extending;
So fall asleep, in slumber deep,
Slumber that knows no ending,
Till Jesus Christ, God's only son,
Opens the gates of bliss—leads on
To heaven and life eternal!"

And the organ wailed a requiem as the mourners passed away, and Albert the Good was buried!

Buried, but not forgotten! He lives for ever in the hearts of those who loved him, and in the memory of the people of his adoption. Those little wreaths and knots of flowers which the hands of his widow and his children placed upon the grave—these pictures in the exhibition—(which owes its existence to him, and may be called, in a mental sense, his child)—these memorials rising up all over the land—the photographs upon the tables of the rich—the rude prints with mourning borders on the cottage walls of the poor—all tell the same sweet tale. That princely presence—that kind and noble face—that gracious manner—that good and generous heart—must ever be remembered, even by a stranger. * * * * *

And with his memory comes a tender thought of the one who was dearer to him than all others, and who now sits desolate in her royal home. When I first landed in England, that happy family circle was unbroken. Now—how changed! The pretty Princess Royal, a wife and a mother herself, and a dweller in another land and home—the Prince of Wales, a traveler in the east and in the west, winning all hearts wherever he goes by his gentle courtesy—the gallant young Prince Alfred, a sailor, "every inch of him," as the old tars say—the gentle, womanly Princess Alice, just about to leave her home for ever—and the husband and the father lying silent in his grave!

It is sad, indeed, to think of all these changes, and to know that they are but the heralds of others. The young birds are leaving the nest—life is beginning for some, and drawing gently to a close for others.

That sorrowing lady must submit to the universal laws of nature, even

as we do; but does she feel them less keenly because she is a Queen? When the sea foams and raves at Osborne, does not the mother think of her sailor boy as sadly as the poorest fisher's wife upon the coast? When the wind moans through the trees at Windsor, does she not wonder how it fares with "England's hope" and hers, as he journeys towards his native land? Is not her heart as tender over her absent daughter as over those who still remain—even to the pretty little child who still plays her baby pranks at her very knee? And, oh! does that widowed heart turn less sadly, less fondly, towards the lonely vault at Windsor, because it beats beneath ermine and velvet instead of a simple robe of serge?

Thinking these thoughts, as every one must do who visits the exhibition for the first time, I gave a last glance at the beautiful face of the dead Prince, and turned away. And although no tie of loyalty or duty binds me to Victoria's throne, from my very heart, as from my lips, fell the pitying words:—

"God comfort the widow and the fatherless,
God keep the mother and her children,

GOD SAVE THE QUEEN."

CLASS IX. AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

This was a very interesting department, and showed great improvement since 1851. The space allotted for English exhibitors was much less than in 1851, and prevented the exhibition of many very valued implements.

The report upon this division by Prof. John Wilson, who had charge of it, is the best we have seen. As compared with the exhibition of 1851, he says: "Although many new inventions are not shown, in almost every department of machines and implements this improvement is shown—iron has been substituted, where practicable, for wood; *light wrought iron* now takes the place of thicker and heavier cast metal; harmony is shown in the different parts; strength is given where the strain or wear and tear is greatest, and where it is small all unnecessary weight is saved. Friction, too, is materially lessened by several ingenious contrivances in the construction of the larger machines, so that the deplorable difference, so often met with, between the *nominal* power and the *practical working power* of some of the older machines is now never heard of." (I noticed, in 1851, the unnecessary weight and complexity of the implements and machinery in use in England, and suggested to my English friends that a great improvement might be secured by adopting the mode of construction of many of our American machines and implements. I was pleased to see that it has been done in many instances, to the great advantage both of the manufacturer and the persons who have the articles in use; but there is still room for further improvements in the same direction, and if not adopted, our machines will find their way there, as they already have done in Australia and other British colonies. These improvements were to be observed in several other classes.)

Reaping Machines and Steam Plows.

Professor Wilson claims, and that justly, that these have been greatly improved. He says: "Although we cannot claim the introduction of many novelties since 1851, still there are two which, from the great success they

have met with, and from the magnitude and importance of their bearings upon the agriculture of the country, stand out in bold relief, and testify that we not only have been improving our manufactures, but also making great progress in the application of science in agricultural engineering. These two salient points of progress are represented by the *reaping machine* and the *steam plow*. The first, it is true, was seen at the exhibition of 1851, and even then was not a new invention. It came, however, to the general public as *a perfect novelty*, and dates its *practical* existence (in England and Europe) from that day. Neither can we say that the steam plow is strictly an invention since that date; it had been tried and had failed before then, and consequently had to be re-invented and re-tried before it achieved the success that now follows it wherever it goes."

It is emphatically true that Cyrus H. McCormick, of Chicago, United States, is to all intents and purposes entitled to the credit of introducing *a practical, successful working reaper* into Great Britain and upon the continent in 1851, as his great gold medal, awarded him at that exhibition, clearly shows; and this is now frankly admitted by all who have investigated the subject as Prof. Wilson has.

There have been improvements made in reapers, adapting them to the state of the crops in different countries, but McCormick's, Hussey's and Wood's American reapers are *the* reapers from which those now in use in Great Britain, and upon the continent, and in the English colonies, are usually constructed, and upon the continent we saw them made precisely after the pattern of ours, and *yet exhibited as inventions of their own*. This is certainly not showing too much modesty in our trans-Atlantic neighbors.

Prof. Wilson states "that cultivation by steam power is destined to supersede that by horse power to an enormous extent;" and this cannot be doubted by those who witnessed the trials made during the past and present year. Fowler's steam plow and cultivator, and Howard's steam plow, seem at present the only successful ones that have been introduced. I give a report upon a trial of these two machines, which I attended, and which took place at Yorkshire, made by Prof. John C. Morton, one of the leading minds in Great Britain. I was greatly gratified at this trial. As Professor Morton's report is very full in every respect, I shall forbear any further remarks. As the question has been frequently asked since my return, whether I consider these machines, as now constructed and used in England, could be profitably introduced into this country, I have invariably answered that, in my opinion, they could not be. I ascertained the expense of operating them, which will be found in Prof. Morton's report, and I believe the expenses would be at least *one-third more* than plowing as ordinarily performed in this country by horse power. But I do not doubt that steam power will be introduced here; but it must be with machinery less complicated and expensive. We shall ere long be furnished with a steam apparatus which, upon large farms, will supersede the use of horse power to a very great extent. While I am writing this report, intelligence comes that a steam digger—a substitute both for the plow and the horse—is to be in operation the ensuing season in this country. Our inventors are alive to the great importance of this improvement, and will not, I am confident, rest contented until the desired result shall be secured.

If we succeed with the spade and the digger, we can return to our friends across the water another boon equal to the reaper and mower, which we have already placed in the field, to cut all the corn and grass in Great Britain.

Plows.

The only new plow specially noticed by Prof. Wilson in his report is that of Hornsby, brought out at the show of the Royal Agricultural Society at Warwick, in 1858. It is but little different from the plows usually in use on the best estates in Great Britain. As there is no use for these plows in this country, I do not deem it important to give a detailed description.

Harrows, rollers, cultivators and *grubbers*, in various forms and well adapted to their work, were shown.

Drills and *sowing machines* of various kinds were shown. Machines for depositing and distributing artificial manures were very largely shown.

Horse hoes were present, and are of very great advantage where the land is well cultivated, and where the crops are drilled in a business-like and regular manner. Its great superiority over hand work is observable wherever they are in use.

The show of portable engines for farm purposes was very extensive, and the engines were exceedingly well got up, and I think upon the whole far in advance of 1851.

Reaping Machines.

Since 1851, it is estimated that 10,000 machines have been manufactured in England, and most of them put in use in Great Britain. Previous to giving the report on steam plows, I will notice the implements exhibited from the United States.

In the United States department the following prizes were awarded, being all the implements of our country before the jurors. Others were received after the jurors had completed their labors, and are referred to in this connection:

McCormick's combined reaping and mowing machine, with self-acting delivery in sheaves, ready for binding and out of the track of the horses. [This report is from the official catalogue:]

"The fame of this machine throughout the world is such that little need here be said of it.

"It may be repeated of the McCormick machine, that at the great World's Fair of 1851 it took the world by surprise, in demonstrating, by its operations *in the field*, the practical success of the *reaping machine*, when the *great council medal of the exhibition* was awarded for it by the council of juries, and it was acknowledged to be the most valuable invention in any contribution to the exhibition.

"Again, at the Universal Exposition of All Nations at Paris, in 1855, it received a like distinction, upon a similar test of its working power, in the award, by a committee of scientific as well as practical jurors, of the *'grand gold medal of honor'* for the best reaping and mowing machine, and as being the original type after which all others were made.

"And again, at the great national trial of reaping and mowing machines in the United States, in 1857, by the United States Agricultural Society,

the only one ever held by that society, the '*grand gold medal of honor*' was awarded for this as the best reaping machine on trial.

"The *prize medal* of the present International Exhibition having been awarded for the splendid specimen of this machine, as now on exhibition, with its automaton appendage, which has attracted so much attention, whilst numerous reports in the newspapers have appeared of its successful operation in different parts of England, the first trial of its powers, in competition with others, came off at Preston on the 2d (September) instant, by the Lancashire Agricultural Society, at its great annual trial of these implements. Of nineteen *entries*, only eight or nine of them entered the corn-field for the test, of which were Samuelson's revolving self-raker and Wood's combined machine, that are also in the International Exhibition.

"The test was a hard and decisive one, first on a heavy and partly laid crop of oats on deeply furrowed land, and next on a crop of heavy wheat, also on furrowed land. The result was the triumph of the McCormick machine, which received the award of the first premium, of £15, and the medal of the society, as decidedly the best machine; the second premium having been awarded for a Scotch hand-delivery machine.

"So decided was the success of McCormick's machine, that at the great banquet on the occasion, at which Lord Derby presided, in a toast given to the successful competitors, while Mr. Patterson's name was coupled with the stock department, that of Mr. McCormick only was selected to represent the whole implement department.

"During the present harvest this machine has operated triumphantly in England, Scotland, Italy, France, Hungary, Belgium and Russia, in which latter country it has had the patronage of the Imperial household.

"Patents have been secured for this machine in most of the corn-growing countries of Europe, where Mr. McCormick hopes to effect its early and general introduction.

"It is gratifying to report the success of Mr. McCormick in 1851, and again in 1862—this last improvement being the very thing desired in Great Britain and on the continent. The admirable manner in which the self-raker leaves the grain ready for the binder insures its introduction everywhere. The number of reapers distributed in Great Britain and on the continent and in the British possessions by Burgess & Key, of London, the owners of the patent of the original McCormick reaper, amount to thousands; and wherever a reaper shall hereafter be introduced the name of *Cyrus H. McCormick*, of Chicago, U. S. America, will be remembered as having first given to the world at large a successful practical reaping machine.

"We are gratified in recording the testimonials so justly due to Mr. McCormick for his energy and enterprize, in having successfully overcome every obstacle thrown in his way, in 1851. Having been present in that year at the exhibition, and having under our charge his machine, &c., we knew some of the means that were used to prevent his securing the rewards justly due to him—but they were of no avail. His machine did all and more than was promised, and the triumphs of 1862, with his reaper and self-raker, will add to his fame, so fully established in 1851.

"The success of this reaper in our country is well known. At least

45,000 machines have been in operation in this country, and the world now, in addition, witnesses in the harvest fields of every nation this same valuable machine in operation."

Walter A. Wood, Hoosick Falls, New York, combined reaper and mower. Medal awarded. Mr. Wood had on exhibition a self-raking reaper, combined reaper and mower, and grass mowing machine, a larger number of his own invention and manufacture than any other exhibitor in that class. Of these several machines, Mr. Wood has manufactured and sold in the United States and Europe, during the last eight years, not less than 30,000.

In 1858 Mr. Wood commenced a series of experiments to test the practicability of constructing a mowing machine that would be light and of easy draft, and at the same time strong and durable. He succeeded in making a mower, which, in all essential points of excellence, simplicity of construction, closeness in cutting, light draft, portability and durability, Mr. Wood claims, gives it a superiority over other machines. The weight is reduced from 800 to 500 pounds. In 1861 the mower received the prize of the Royal Agricultural Society, at Leeds.

At the trial of the Yorkshire Agricultural Society, on the 5th August, 1862, it received, after a very animated contest, the first prize; and it was decided there, as stated in one of the reports on the exhibition, "That either for lightness, handiness, or perfection of execution, Wood's machine fairly beat all the others." Having been present at this trial, and having carefully watched the performance of the several mowers at work, we entirely concur with the award which was made. In France, in 1860, this mower received the *grand gold medal* of honor as the best machine on trial; also a gold medal and 1,000 francs as the best foreign machine.

Mr. Wood manufactures all his machines in this country, and has an agency in London for Great Britain and Europe, where all his machines can be had.

Russell & Tremain, Fayetteville, Onondaga Co., N. Y., a new reaping and mowing machine. This machine has an entirely new and simple device for operating the knives of harvesting machines *without any gearing*, which consists of a series of rollers placed on the inner face of the driving wheel, which, when the wheel revolves, run on the flange of a screw or worm attached to the crank shaft, the passage of each roller causing one revolution of the screw and crank. An honorable mention awarded.

Several of these machines were sold in England and placed at work in the harvest field, and gave good satisfaction. I attended a trial of one of them with some Spanish gentlemen, and it performed its work well and to the satisfaction of those present, and we believe the machine was purchased for Spain.

Kirby's patent combined mower and reaper, and Kirby's single mower, exhibited by Kirby & Osborne, Auburn, New York. Honorable mention awarded. These machines are well known in this country, and are among the most popular in market. The manufacturers say that they have made and sold in the United States during the last four years about 12,000 machines, and the demand has exceeded their ability to supply. The peculiar features are an independent action between the driving wheel and finger bar when mowing, so that they may each follow their own ground,

and each play up and down independently of the other. The driver's seat is so pivoted over the driving wheel, that the weight of the driver balances the weight of the frame and the downward pressure on the horses' necks, and throws the whole upon the driving wheel, thus adding to the power of the wheel, and materially lightening the draft of the machine. It has an adjusting overhanging reel, used either in mowing or reaping, or not, as desired, and a revolving track cleaner, which spreads the grass evenly. By means of a lever at the side of the driver, either or both ends of the cutting apparatus may be lifted, to pass obstructions or move from field to field. The machines are light and strong, and being made mostly of iron and steel, are very durable and not liable to get out of order. Mr. Osborne had several machines with him; they were tried in the field in different parts of the kingdom, and gave, I believe, much satisfaction, and all of them were sold to farmers.

Douglas Axe Co., Massachusetts, showed a case of highly finished American hardware, mainly axes and wood-working tools, and were awarded a medal.

Blanchard & Brown, Dayton, Ohio, a new and valuable invention for planting cotton seed. A man with a horse can plant from eight to ten acres a day, and the work better performed than by hand. Medal awarded.

Levi A. Beardsley, South Edmonston, New York, hay and earth elevator. Honorable mention.

Robert Price, Albany, New York, exhibited a churn and a mop; for the latter an honorable mention.

D. R. Prindle, East Bethany, New York, model corn and bean planter and agricultural boiler—excellent invention, and worthy the patronage of those desiring implements of this kind.

The *American Cow Milker*—Colvin & Kershaw, Philadelphia, alluded to in class eight—attracted as much attention as any other article of a practical nature in the exhibition. A medal awarded. This machine was tested upon cows daily during the week, on grounds adjacent to the exhibition. It was sold to an English company for £5,000; and since the exhibition closed a notice of the success of the purchasers appeared in one of the English papers, in giving an account of an agricultural meeting, where it was stated that the sales, up to that time, amounted to more than the price paid for the patent.

After our articles had been passed upon by the jurors, who awarded 88 prizes to the 95 exhibitors, the London *Times* gave an account of a part of our exhibition, and called attention to the United States department as having received a *larger share* of prizes than any other nation, and advised visitors to take a look at the American division, where they would find many interesting articles. This advice was heeded, and our quarter, after the awards were made, received a full share of attention until the exhibition closed.

It is due to our exhibitors, who had the courage to enter this great field of competition, and who so successfully carried off the prizes and sustained the well earned fame achieved in 1851, that this tribute to their valuable inventions should be given.

Orman & Co., of Ozaukee, Wisconsin, exhibited a cultivating harrow,

which was a most valuable invention and attracted much attention, and was evidently one of the new inventions worthy of special commendation.

Batchellor & Sons, Wallingford, Vt., a case of implements—hay and manure forks, hoes, &c., which are highly prized in England, and an agency is there established for their sale. Medal awarded.

James F. Dane & Co., Springfield, Ohio, steel plows. These were awarded a medal, and were in great demand.

In speaking of the agricultural implements and machinery in the exhibition, and their influence upon the industrial interests of the world, an English writer says:

"Observe the automaton machine, which deposits the seed in regular lines, at an equal depth, accompanied by nourishment suited to its earliest development; near it is the implement which follows, cutting down the weeds as they appear, and allowing free scope to the cereal blade. Then we have the iron reaper, with his keen, swift sickle edge, before whose radical progress the grain bends and falls, for preservation, when ripened by the suns of summer; and lastly, behold the great steam driven flail, which at once lashes the grain from its retreat, and assorts it for use. These are but a few typical forms, but they are sufficient to suggest the part played by machinery in the great work of food production. The country districts have been drained of their population. The last census shows a singular decrease in the simply rustic enumeration. The wilds of Australia, the backwoods of America, the gold gains of auriferous regions, and the temptations of large wages in the mills and iron works and railway enterprises of our country, have drawn Hodge from the quiet village in spite of the law of settlement, and yet the business of the farm goes on as well as ever. The area of land under cultivation is increased, its fertility is increased. Machinery has enabled us to effect the solution of an economic problem, whereas, in a savage state, one man can barely obtain enough from the soil for the supply of his own wants and those of his family. We have arrived at a state of civilization, by the use of machinery, to multiply our single force without increasing consumption, in which the labor of one man suffices to supply the wants of nearly four, so that while one is retained in the field three are sent to the towns to work for the world's great bazaar, and are supported while thus increasing the national wealth. The results of human skill in other departments, therefore, splendid and beautiful, are directly due to the implements of husbandry, here less attractively displayed, but which have set men free from the culture of the soil and the production of essential food for the gratification of the mere luxurious wants that always characterize the progress of civilized man. If, then, we preserve a due sense of the relationship which subsists between the delicate tissues of the loom, or the ennobling works of art, and the farmer's wheeled plow, or, better still, the steam drain cultivator, a passing glimpse of the contents of this matter-of-fact section will not fail to afford satisfaction.

"It is, however, in the progress made by the reaping machine, and the creation of the grass mower, that the most rapid progress has been made. McCormick's and Hussey's machines were only just introduced, and tried for the first time upon the crop of 1851. Since that date, Bell's reaper, a

Scotch machine, an old but discarded implement, has been brought into notoriety. Hussey's principle has been adopted and improved, while Burgess & Key have adapted McCormick's patent to the wants of English, colonial and continental farmers, and caused us to forget the days when Erin sent her sons, in pepper and salt dress coats and footless stockings, to bind Anglo-Saxon sheaves by the light of the harvest moon. The whir of the grass mower had not then been heard by the hen partridge as she sat complacently upon her speckled eggs, much less was there any thought of a combination of these two implements, to be sold for the price one fetched in 1851."

Trial of Steam Plows, Yorkshire Show, York, England, August 5, 1862.

PROF. J. C. MORTON'S OFFICIAL REPORT OF THE TRIAL.

The field set apart for the exhibition of steam plows and cultivators, though perfectly well fitted for showing the machines at work, being large enough for three or four hours' trial of all the different implements upon the ground, and providing a furrow upwards of 300 yards in length, is yet very ill adapted for the illustration of steam cultivation. It is for the most part of an extremely light soil, and thus presents none of that difficulty as to either the labor or the quality of horse cultivation which proves on stiffer land the advantage of applying steam power to the cultivator or the plow. And besides that, there extends across the field a narrow band of stiff clay, which requires a double or triple power to cross it, so that the engines employed had to be worked throughout the furrow at much higher pressure than was needed, except at particular moments. A spectator had thus no sufficient opportunity given to him of ascertaining aright either the advantage or the cheapness of the cultivation of the land by steam. He had, however, ample opportunity of seeing how the machines of Fowler and Howard were worked, and his own experience in cultivation elsewhere might enable him to judge of the advantage they possess on the stiff soils of the country.

It is indeed impossible to overestimate the advantage of steam cultivation on stiff clay lands. They are dependent on proper cultivation even more than on the application of manures for their fertility, for they are already full of the food which plants require if we only could get it. To this end they need to be broken up and exposed throughout their depth to the free access of air and weather. But there are comparatively few days during the year in our climate when this can be done by horse power, for they are generally either baked by the sun, so that horses cannot pull the plow or cultivator through them, or they are so softened by the rain that the trampling and the sliding of the team and tool will do more to close the land than open it. We want a power which shall make the full use of the short intervals when such land is in proper condition for tillage operations, and which shall at the same time avoid the evil of poaching the land above and hardening it below, which in the horse cultivation of clays is too often seen. A four horse team and plow weigh more than forty cwt., and all this goes trampling and sliding from end to end of the field that is being

plowed, over every ten or twelve inches of its width; and thus of course a floor is formed beneath the soil, hindering drainage, which is the greatest improvement of which clay lands are capable. We want a tool not weighing more than four or five cwt. for every foot in width worked by it, carried on wheels so as not to close the surface over which it travels, and driven by a power which shall not press upon the land that is being worked.

All this we have in the steam drawn plows and cultivators that were seen at work yesterday. The plows employed weigh not more than five to seven cwt. per foot of width, and both are carried on large wheels at wide intervals, thus traversing the field but once to every four or six feet width. The engines driving them either travel on the headland, as in Fowler's apparatus, or they may stand altogether out of the field, as in Howard's case. In both cases the tools can be drawn with wonderful effect through sun-baked clay which horses could not touch; and (supposing the land to be fit for horse work) in both cases the mischief done by drawing a heavy tool across the land that wants loosening and cultivating is reduced to a minimum, while for speed of work, in order to the full use of the short times when clays are fit for cultivation, the advantages of steam power are in both cases beyond a question.

We saw the speed of steam cultivation well illustrated yesterday, and the superior quality of steam cultivation was also sufficiently well shown, for the patches of clay land in the field were plowed and cultivated, and the lighter soil was thrown about, so as no horse power could have done it.

The cost of the work cannot be illustrated by a few hours' trial, but there is now experience, both of Fowler's and Howard's apparatus, over years enough and acreage enough to prove that their better cultivation is generally attained at much less cost than is incurred in horse labor. I have walked over many thousands of acres cultivated by both, and having been allowed to inquire particularly into the history of steam cultivation over many score of farms in all parts of the country, I am able to speak with some confidence on this point. It will be found that taking every particular of the expense into the account—wages, fuel, breakages, and tear and wear, and interest of capital—good plowing may be done by steam for from 8s. to 10s. per acre, and one way grubbing for from 5s. to 8s. per acre, which under horse labor would have cost 12s. to 18s., and 6s. to 10s., respectively, for much inferior work.

There is, I believe, no one, unless he be interested in the success of one or other of the rival firms engaged in the manufacture of steam plows and cultivators, who will not greatly prefer thus confidently to report the unquestionable success of steam cultivation generally, rather than venture to compare the rival methods of it after a few hours' trial and inspection. Having, however, undertaken the duty of drawing up such a comparison, I have now to relate the performances of the machinery that was exhibited at work.

On one side of the field an ordinary Clayton & Shuttleworth's single cylinder 8-horse-power movable thrashing engine drove by strap, a movable anchor furnished with clip drum, by which the draught rope extending

from it around another movable anchor on the farther headland was drawn to and fro, and with it Fowler's ordinary 4-furrow balance plow. The engine has a single 9-inch cylinder, with 12-inch stroke, and it was working at a pressure probably upwards of 70 pounds, the gauge standing occasionally as high as 80 pounds; though I was assured it was indicating beyond the truth,—being out of order.* The engine was making about 130 revolutions per minute during the trial. The plowing, as I measured it, was hardly 5 inches deep. The furrow was 330 yards long. The plow made close on 13 journeys along this furrow within the hour, losing 6½ minutes on the headlands, and 1½ minutes during one stoppage. Exactly one acre (not half a perch more) was accomplished within the hour. The men employed were: engineman, two anchormen, one plowman, and two porter lads. The rope was well carried on 12 rope porters, which stood rather less than 50 yards apart.

The central plot allotted to Messrs. Howard, was partly plowed and partly cultivated. In their new three-furrow balance plow, the two frames carrying the plows balance one another, not, as in Fowler's machine, by being both part of one rigid frame-work, thus balancing over the axle of the wheels which carry it, but by each hinging on separately to a central framework, which runs on three wheels; and each, as in its turn it drops into its work, lifts the other off the ground, the chain which connects the two passing over cams or eccentrics, thus giving to each, as its turn comes to work, an advantage in weight over the other.

The plow is drawn to and fro by a Clayton & Shuttleworth's ordinary 10-horse-power engine, with 7-inch double cylinders and 12-inch stroke. It was working up to 70 pounds pressure, and making from 125 to 130 revolutions per minute. It drives a double windlass, each barrel being geared into work alternately, while the other, which is then paying out the slack-rope, drags upon a wooden stud, on which it drops when out of gear. The patent snatchblock arrangement, by which the drum is hindered from paying out rope any faster than its neighbor pulls it in, was also in operation, the advantage of it being that the slack rope behind the plow is kept at sufficient tightness to prevent its dragging on the ground. This rope runs all round the part of the plot which remains unworked, and was carried on eight high rope porters on wheels and nine lower ones, and on eight wheeled lower porters along the furrow on which the implement is at work. These latter porters are furnished with an ingenious leverage, enabling the porter lads very easily to shift them and replace them. The men employed here were: engineman and windlass man, two anchormen to shift the pulleys at either end of the furrow as it encroached on the unworked part of the land, one plowman and two rope porters. The work accomplished with the plow was as nearly as possible (not half a perch less) three roods within the hour; and I estimated it at fully 5 inches deep. The ground was here, upon the whole, more difficult than where Fowler's plow was working; the clay patch being wider here than there. The work was

* It is proper to remark that the disc indicator of steam pressure attached to this engine was out of order—the index pointing to 52 pounds all day long! so that many spectators must have gone away with the impression that all the work done here was accomplished by about two-thirds of the force that was actually employed.

accomplished in 14 journeys of the three-furrow plow, along a furrow 314 yards long; seven minutes were lost on the headlands, and one minute was lost during a stoppage.

Howard's three-tined cultivator, furnished with teeth projecting both ways, so as to come into operation on both the forward and backward journey without turning at the land's end, was also tried here. At first it was set too deep for the power of the engine when on the clay; and as it is not provided with any means by which the man can at once release it in any degree from its work, when once it stops, there it must remain until the engine acquires power to pull it through. Thus, during the first half hour it made only four journeys, cultivating very deeply and thoroughly rather less than a quarter of an acre in that time. During the next half hour of its trial, when it was working at a less depth, it made seven journeys, accomplishing close on half an acre in the time, or at the rate of one acre per hour.

The outer plot was set apart for Fowler's 14-horse power engine with double cylinder of 7⅜ inches, with 12-inch stroke, working at about 75 pounds per inch, and making 150, often 180 revolutions per minute. The speed of its work was indeed such, that when on the lighter parts of the field the furrow slices were thrown from the mould-boards or digging breasts fully 30 inches on one side, making quite a wave of earth, which was tossed off them in a thoroughly smashed condition—tossed, however, into heaps which would require rather a laborious leveling during the next tillage operation. There are here one engineman, one plowman, one anchorman and two porter lads employed. The four-furrowed balance plow, with the digging breasts, makes about 9½ journeys along a furrow 318 yards long—losing only 2½ minutes on the headlands—during half an hour, plowing nearly six inches deep, at the rate of one acre one rood 5½ perches per hour.

The 7-inch grubber was then tried, only six tines, however, being in operation; thus accomplishing a width of more than 5½ feet at a mite. It made 8½ journeys in the half hour, doing very thorough work at the rate of about one acre three roods twenty-four perches per hour. The advantage of great rate of speed was shown in the complete wreck and smash of the earth that was moved. It was, however, here also, though in a less degree, occasionally left too irregularly for easy treatment afterwards with the harrows; and a less speed would, on this account, have been better. Howard's cultivator, driven not nearly so fast, was found, on examination, to have moved as much earth per superficial yard; but it was merely moved, not tossed about, and it would need, therefore, a crossing with the cultivator before the ordinary harrows would take hold of it. Whereas Fowler's work would no doubt have been laid hold of by the harrow at once; though, as already said, sometimes too much laid in heaps.

In order still further to compare the work done by the several cultivators and plows upon the ground, it was resolved to attempt an estimate of the earth moved per acre in the several cases. To this end a frame, 4 feet by 4 feet 6 inches—inclosing, therefore, two square yards of surface—was provided; and all the earth within this frame, which was dropped here and there on the several plots, was carefully collected and weighed. The fol-

lowing tables represent the work accomplished by the several machines as thus ascertained:

1. Fowler's (so called) 8-horse power engine with movable anchor, carrying clip drum and a four-furrow balance plow.

Laborers employed: Four men and two lads.

Estimated depth of work: Barely five inches.

Quantity plowed per hour: One acre.

Weight of earth moved per square yard ascertained in four instances:

No.	Stones.	lbs.
1	35	3
2	29	0
3	31	2
4	28	10
Average weight of earth moved per yard	31	0
Weight of earth moved per acre		938 tons.
Weight of earth moved per hour by the so-called 8-horse power engine—4 men and 2 lads		938 tons.

2. Howard's (so-called) 10-horse power engine with windlass, and three-furrow balance plow.

Laborers employed: Five men and two lads.

Estimated depth of work: Fully five inches.

Quantity plowed per hour: Three roods.

Weight of earth moved per square yard, ascertained in four instances:

No.	Stones.	lbs.
1	26	10
2	30	10
3	35	3
4	30	7
Average weight of earth moved per yard	30	11
Weight of earth moved per acre		932 tons.
Weight of earth moved per hour by the so-called 10-horse power engine—5 men and 2 boys		774 tons.

3. Fowler's (so-called) 14-horse power engine with 4-furrow balance plow, and digging breast.

Laborers employed: Three men and two lads.

Estimated depth of work: Close on 6 inches.

Quantity plowed per hour: One acre one rood 5½ perches.

Weight of earth moved per square yard, ascertained in three instances:

No.	Stones.	lbs.
1	31	3
2	34	0
3	35	3
Average weight of earth moved per yard	34	2
Weight of earth moved per acre		1,002 tons.
Weight of earth moved per hour by the so-called 14-horse power engine—3 men and 2 lads		1,280 tons.

4. Howard's 10-horse power engine, double windlass, and 3-tined cultivator.

Laborers employed: Five men and two boys.

Weight of earth moved per yard, ascertained first when going deeply and doing ½ an acre per hour, 33 stones, equal to 998 tons per acre, or about 500 tons per hour. In this case, however, as already stated, the stoppages were frequent, the power being insufficient.

In the second case the weight of earth moved, when the cultivator was going shallower and doing one acre per hour, was ascertained in three instances:

No.	Stones.	lbs.
1	24	4
2	19	7
3	22	0
Average weight of earth moved per yard	21	12
Weight of earth moved per acre		660 tons.
Weight of earth moved per hour by the so-called 10-horse power engine—5 men and 2 lads		660 tons.

5. Fowler's (so-called) 14-horse power engine, with 6-tined cultivator.

Laborers employed: Three men and two lads.

Weight of earth moved per square yard ascertained in five instances:

No.	Stones.	lbs.
1	22	7
2	22	7
3	20	0
4	24	0
5	20	0
Average weight of earth moved per square yard	21	10
Weight of earth moved per acre		660 tons.
Weight of earth moved per hour by the so-called 14-horse power engine, 3 men and 2 lads		1,240 tons.

The weight was here taken in so many instances because it was supposed that some mistake had been committed, the quantity of earth moved per acre by Fowler's cultivator certainly appearing to be very much greater than that moved by Howard, whereas repeated weighings proved it to be actually somewhat less. The fact was that it was thrown about so much more roughly in the former case that it lay looser and appeared deeper than it was. And one result of these weighings is to prove the fallacy of estimates of work of this kind by mere measurement, however honestly performed. The quantity of earth moved per hour (per day) is of course very much greater in Fowler's case than in Howard's. The power employed was much greater—how much greater is probably inadequately represented by the nominal horse-power of the several engines. The reader has, however, before him, in the speed of the engines and the size of the cylinders and the pressure of the steam, the means of comparing pretty accurately the power employed; and, contrasting this with the work accomplished in the several instances, he will draw his own conclusions of the merit of the several machines at work.

It is proper to add that the results of a racing trial do not necessarily represent the ordinary experience of the farmer, and that the above is to be taken as absolutely true only of the case here described, where plows and cultivators were employed on a clover stubble in a light sandy field for an hour or two last Tuesday. It is also fair to add that the clayey part of the field extended more and more towards the latter side of the field here described, so that Fowler's 8-horse power engine worked on lighter land, upon the whole, than Howard's 10-horse power, and this latter on rather lighter land than Fowler's 14-horse power engine.

We add the prices of the apparatus employed:

1. Fowler's 8-furrow plow, 800 yards of rope, 5-tined grubber and rope porters, two anchors	£295	0	0
8-horse power engine	235	0	0
2. Fowler's 14-horse power engine, 4-furrow plow, rope porters, 800 yards rope and anchors	875	0	0
7-tined cultivator	70	0	0
3. Howard's double windlass, 1,400 yards of rope and cultivator	220	0	0
8-furrow plow	50	0	0
10-horse engine	295	0	0

JOHN C. MORTON.

AUGUST, 1862.

CLASS X. CIVIL ENGINEERING, &c.

Civil engineering, &c., was an interesting class. No exhibitors from this country.

Section B, Sanitary Improvements.—No exhibitors from the United States. There are no remarkable discoveries in this class. *Ventilation*, which it was hoped would receive a solution in the exhibition, and thousands of lives now annually consigned to the tomb by our ill-ventilated houses, churches, lecture rooms, halls of legislature, railroad cars and steamboats be saved; but the jurors say "there is nothing in any of the attempts to secure permanent ventilation calling for special remark." When will the time come when this subject shall be *ventilated?*

CLASS XI. MILITARY ENGINEERING, &c.

A much larger display than in the former exhibition. It is said more progress has been made in the past ten years than at any former period of like duration. *Rifled cannon*, both breech and muzzle-loading, have received their practical development since 1851. England was the only nation which had attempted anything aproaching a full and complete exhibition of its implements of war—the Armstrong and Whitworth guns, Enfield rifles, made at Greenwich, on machinery from the United States, &c.

The American breech-loading rifle is specially noticed as introducing a new arm into the service.

Colt's revolving pistols and arms received *a medal.*

CLASS XII. NAVAL ARCHITECTURE.

Greater and more important changes in naval architecture, in its application to purposes both of national defence and commerce, have occurred since 1851 than in any previous interval of time. The armor plating of vessels, the cupolas for warlike "monitors," the change of form of vessels, &c., all have appeared since 1851. The screw propeller in the same period, in a great measure, has superseded the paddle-wheel in ships destined for long voyages, and many commercial gentlemen with whom I conversed believe they will eventually supersede them everywhere. Economy will demand this. Already one line of packet propellers from Liverpool to New York is in operation successfully, and the Cunard line is adopting propellers.

W. H. Ward, of Auburn, received a prize medal for his *night signal telegraph*, which has been adopted by the French government and the Viceroy of Egypt. The English navy department has secured it. Before going abroad, I understood Mr. Ward, it had been offered to our government, but

refused through the influence of some one who might probably have done more for his country by acceptance of it than by some other projects which might be named and which have found favor.

A model life-boat, exhibited by John F. Schott, of Wisconsin, embraced some new principles calculated to afford safety and comfort to the ship-wrecked at sea.

The New York Life-Saving Benevolent Association is highly commended for its benevolent efforts in saving lives. Up to 1854, 1,500 persons had been saved, two-thirds of whom had been brought to shore in the life-car, and probably a still larger number since that period.

Class XIII. Philosophical Instruments.

This class was fully represented. England and France had much the largest exhibitors.

Darling & Schwartz, of Bangor, Me., were awarded a prize medal for the excellence and accuracy of the manufacture of their steel scales and straight edges.

Class XIV. Photographs, &c.

The exhibition in this class was quite extensive, and a large collection of photographic apparatus and appliances was shown, exhibiting improvements up to the present time. Specimens of photographic engraving were shown; also photographs on zinc, a principle successfully applied to the printing of the ordnance maps of Great Britain. Printing in carbon, or photographs which are as permanent as engravings, was exhibited. Full-length portraits, as large as life, were exhibited; and the collection of colored photographs were very attractive, comprising portraits of many distinguished men of the present time.

Brady, of New York, sent over a collection, comprising some of our public men, which was exhibited in the United States department, and attracted much attention; but as they arrived after the awards were made, they were not passed upon by the jurors. No finer collection than that of Brady was on exhibition.

I find in the awards an honorable mention to the exhibitor of a series of busts of the Governors of the States of America; but I do not find the name of the real exhibitor (as the name given in the awards to a gentleman in New York is incorrect, he having no knowledge of the matter). The award is in my hands, and will be delivered to the exhibitor when he appears.

Class XV. Horological Instruments.

Chronometers, clocks, watches, &c., of great variety and great excellence, were exhibited. England, France and Switzerland were the most extensive exhibitors. The novelties were improved designs rather than new movements.

Holloway & Sons, American agents, London, exhibited in abundance American clocks, which are found in almost all the hamlets in Great Britain, and also in other countries, and they are not excelled by any of the same description, as to price or execution.

Class XVI. Musical Instruments.

In this class there was a very complete collection of instruments, and a great competition before the jurors, as usual in this department. Eng-

land, France and Austria were the most extensive exhibitors. England was largely represented, and the pianos were of great excellence, fully sustaining the reputation long since accorded to them. France was most fully represented, and sustained the position so long enjoyed by their very superior instruments.

Steinway & Sons, New York, U. S., grand and square pianos. Medal awarded for "powerful, clear and brilliant tone of piano, with excellent workmanship, shown in a grand piano and a square piano of very large dimensions," which places Messrs. Steinway & Sons *at the head of the whole list of instruments of that class*, and where they are most worthily placed. The sale of these pianos, and orders for others, showed the appreciation of the musical public for these valuable instruments.

G. H. Hulskamp, Troy, N. Y., grand piano of new and novel construction, and for which a prize *medal* was awarded. The principle of straining the sounding board, as shown in this instrument, and also in a violin exhibited by him, was considered of much importance. The violin was said to be the first improvement in violins since the Cremona, invented centuries ago. The piano was sold, at a large price, to a distinguished gentleman in London whose name is known in every country on the globe.

Melchier & Ducher, New York, piano and two triolodians; much admired.

Class XVII. Surgical Instruments.

This class was largely represented, and many very valuable instruments have been added to the list of 1851, and great improvements in surgery since that period. In the appendix a full report is given by the jurors in this class, and we confine our remarks to the exhibition from the United States.

In this class Dr. Robert Bates, from Philadelphia, was awarded *a medal* for his very ingenious instruments for the relief of stammering. Dr. Bates was very successful in his operations, relieving the most painful cases in a few moments, and, by attending to his instructions, the subjects would be relieved, and could obviate all the difficulties experienced before the application of his instruments. His method received the approbation of the most distinguished medical gentlemen in London, and also from those in attendance at the exhibition. We give a brief description of his manner of operation:

Mr. Bates' instruments are devised upon the simple principle of allowing a small volume of air to escape between the tongue and the roof of the mouth, during the spasmodic attempt of the former to articulate the lingual sounds of *d*, *t*, &c.; or between the cheek and tongue in its efforts to utter the labial sounds; or through the vocal columns in the case of gutteral sounds. The *first* of these effects is produced by an exceedingly small metallic obturator, which is placed against the roof of the mouth in the hollow formed by the summit of its arch and back of the two central incisor teeth; the *second*, by a small button, perforated in the center by a crowquill, which sits in the hollow of the cheek, and emits air by the angle of the mouth during the attempt to speak; the *third*, by an elastic band round the neck, which makes the pressure on the *pomum adami*, and prevents the complete closure of the vocal cords during the spasm. Having

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ANNUAL REPORT OF NEW YORK

confirmed stammerers,
good effect; and they have
use for a space of time varying with
concerned in this troublesome affection
proper action as to enable the patient to do
Dr. Black, one of our jurors, took great interest
means of securing subjects and bringing them
Dr. Bates was enabled to satisfy all of the great
improvements Dr. Bly's leg, which allows both
movements, and permits the patient to walk equally
ground, deserves special mention. This valu-
was first publicly brought into notice by the New York
Society, at its exhibition at Syracuse, N. Y., in 1860,
to be assured that this distinguished jury has selected
great improvements since 1851.

Alexander Yard, New York, samples of water-proof court and adhesive plaster, which the London surgeons, on trial, pronounce superior, and commended to the profession.

Prof. J. C. Mathews, New York, fumigator for the lungs, a new invention.

The report of this jury is a most interesting and important one. It shows a great advance in the treatment of surgical diseases, and many new instruments have been introduced, which have proved of great value to the operators, and it is hoped comfort and relief to the subjects. In 1851 only eleven nations were exhibited—in this, twenty-one have contributors, and Japan, in addition, shows several instruments that give evidence of progress in surgery there.

Class XIX. Flax and Hemp.

We had no exhibitors in this class. There were very full reports in relation to the present state of flax culture and manufactures. One of the best was made by Prof. J. F. Hodges, M. D., of Belfast, chemist to the Agricultural Society of Ulster. He is one of the ablest men in the field in Europe, and his report embodies all that is known as yet in regard to the flax plant and its manufacture, and must be of great interest at this time, when so much is being done in our country for the improvement in the culture and preparation of flax. We believe that flax as a substitute for cotton will yet be secured—the time, we hope, is not far distant.

Class XX. Silk and Velvet.

The report of the jury contains a very full account of silk manufacture. An interesting account is given of a new producer in this field, Japan, which is just beginning to enter into competition with the other nations for a portion of this trade. In several departments the Japanese furnish articles which are not excelled, if equaled, by any other nation. Japan silk imported into England, 1862, 10,844 bales, of which 10,178 bales were consumed; the quality of some descriptions treading closely upon the best European silk.

CLASS XXI. WOOLEN AND WORSTED FABRICS, &c.

The exhibition in this class was one of great merit, and the competition between the countries which exhibited largely was very spirited, especially between England, France, Austria, Belgium, Prussia and Saxony—France receiving the largest percentage of medals. The improvement of machinery in this class is very great, and enables the goods to be manufactured at much less cost than formerly. We had a single exhibitor. The Manchester Print Works had delainès and woolen hose, and received a prize medal. Shoddy, a name unfortunately known in the United States, is second only to wool in commercial importance in Great Britain. There have been very great improvements made in this class since 1851.

CLASS XXII. CARPETS.

This was a class of great merit. India and Turkey showed each some extraordinarily choice carpets. England and France were the largest exhibitors, and their reputation was well sustained, they receiving a large share of the prizes. We observed a carpet, suspended on one side of the exhibition hall, with the price labeled, "for sale, £800,"—$4,000. I presume it was sold. The higher the price the more sure of sale; the man who desires notoriety in the public papers will become the purchaser.

CLASS XXIII. WOVEN, SPUN AND FELTED FABRICS, &c.

The exhibition was not very large in this class. England, Austria, France and Prussia were the largest exhibitors, all of whom had very superior goods. There have been great improvements made in dyeing since 1851. The use of coal tar has made a great change in the art, and prices are much reduced. Calico printed fabrics have very largely increased. A medal awarded Manchester Print Works, U. S., for printed fabrics.

CLASS XXIV. TAPESTRY, LACE AND MANUFACTURES.

England, India, Belgium, France and Switzerland were the leading exhibitors, and the display was extremely rich and attractive; and the most costly laces found purchasers among the nobility and gentry at prices which would be considered fabulous here. France exhibited real French lace. The laces at Alençon are made with the needle, and employ 8,000 women. This lace on exhibition sustains its renown as "the Queen lace," for its fineness. There are employed in the manufacture of different laces in France upwards of 200,000 women and girls.

CLASS XXV. FURS, FEATHERS AND HAIR.

Nothing of special interest in this class. Wilkins & Co., New York, received a medal for curled horse hair.

CLASS XXVI. LEATHER, HARNESS, ETC.

Joseph Kohnstamm, New York city; H. Kohnstamm, 33 Dowgate Hill, London, agent. A substitute for Morocco leather, extensively used for covering furniture, railway carriage seats, traveling necessaries, carriage linings, etc., and, indeed, for every purpose of ornamental covering in place of leather. It is an article well known to the public, and acknowledged by all to be the best substitute for leather that has yet been introduced,

It was invented by the Messrs. Crockett, of America, in 1855, since which time it has also been manufactured to a large extent in England. It is made in all shades of color, and grained to exactly imitate Morocco leather; is perfectly waterproof, being used largely in making leggings, and in the late Crimean war the French ambulance wagons were covered with it. The present American army is also equipped with capes, knapsacks and leggings made from it. It is also applicable for the purpose of book-binding. On account of its cleanliness it has almost entirely superseded the use of the old fashioned haircloths (which hold the dust), for upholstery work, in covering chairs and couches.

Its adaptability for the purposes above mentioned, together with its durability and cheapness, in comparison with leather, (being less than one-fourth the cost of the latter,) has caused it to be ranked as one of the most useful necessaries of the age.

Class XXVII. Articles of Clothing.

Section B.—Saponification.—R. A. Tilghman, Philadelphia, for fatty acids from aqueous saponification, prize medal.

Section C.—Manchester Print Works, U. S., woolen hosiery; honorable mention.

There was nothing of very special interest in relation to this class.

Class XXVIII. Paper, Stationery, etc.

There were 47 exhibitors of first class paper made from rags; 38 exhibitors in all other classes from rags; 85 in all.

Paper made from rope, 4 exhibitors; straw, 7 exhibitors; esparto, 1 exhibitor; hop vine, 1 exhibitor; wood, 1 exhibitor; unknown materials, 1 exhibitor; 15 in all.

Four exhibitors of paper from materials hitherto but little or never employed, viz: one from wheaten straw; one from oat straw; one from esparto, Alfa or Spanish grass; one from hop vine. The paper from hop vine appeared good in quality. H. Votter & Sons, Herdenheim, show a large variety of paper, of various colors, made chiefly from wood fiber, 80 per cent., the remainder rag fiber. This is patented in the United States, and is said to be used largely in Europe. In France, Belgium, Denmark, Sweden, Russia, Austria and Prussia, special wood pulp manufactories, on Votter's system, are at work. In England, 147 patents have been taken out from 1852 to 1857, for improvements in paper making, mostly new materials; but with the exception of straw and esparto, and on a more limited scale the hop vine, none of the patents have gone into profitable use. As yet there seems to be no satisfactory substitute for rags for white paper.

Exhibitors from United States.—Dexter & Co., N. Y., books in the Indian languages. H. Stevens, 4 Trafalgar Square, London, American books and photographs. S. Low & Co., Ludgate Hill, London, American books. Gunn & Co., 10 Strand, London, American newspapers. M. P. Jewett, Poughkeepsie, N. Y., catalogues of female seminaries in the United States.

Class XXIX. Educational Works.

S. Taints & Co, Philadelphia, exhibited map of the United States. This was a new department, and a very interesting and useful one; and had our

country been represented as it might have been, a great boon would have been afforded to the world, and our great improvements in common school education would have received attention, and would in many countries, I have no doubt, been adopted. The countries most distinguished were England, France, Italy, the German States composing the Zollverein, Austria, Prussia, Belgium and Norway. In *Austria* there has been remarkable progress in "intellectual culture" during the past fourteen years. In a population of 35,795,000, Austria possesses 29,972 public primary schools, among which are 824 higher elementary schools. Salaried teachers and assistants amount to 39,825; children in attendance, 3,909,000, of whom 2,723,400 are in primary schools. Attendance is compulsory from the sixth to twelfth year.

France provides primary schools generally in every commune. There are in all 39,600 of these for boys, and 25,500 for girls. Of these, 50,100 are public schools, and entirely supported by the State. The remaining 15,000 are private schools, under inspection of government, and receive aid.

Holland, in 1784, through the "Society for the Public Good," a voluntary institution, originated the movement in favor of national education. The government subsequently adopted it. In 1806 an efficient system of inspection was set on foot, and it is probable that Holland was the best educated community in Europe. Each commune now is obliged to establish a primary school. Normal schools are sustained by the State, and certificates of morality and of capacity to teach are demanded of every teacher, public or private. The pupil teacher system, which has been so useful in England, was introduced from Holland.

Prussia.—The legal period of study is about eight years, and between certain ages all the children are obliged to be at school. In 1856 the total number of children of school age amounted to 2,943,287; of whom 2,758,472 were in public schools, and 70,220 in private licensed elementary schools. School fees, paid first by children; second, local rate (and this usually); third, general taxation. The elementary schools are confined to teach that elementary skill which every citizen needs, whatever his future calling may be. Compulsory education is applied either directly by penalties upon the parents or by legal disabilities, which apply to all who have not attended school, in eighteen governments and all the Swiss cantons but four.

In *England* the action of the State is very partial, only extending to 10,900 schools. The government does not originate any school, nor insist upon the establishment of one by local authorities, even where destitution is the most apparent. It does not publish school books, nor prescribe or recommend any. The rule of State action in England is to help, to stimulate and to direct voluntary efforts, but not to supersede them. The National Society for Promoting the Education of the People in the Principles of the Established Church was instituted in 1811. The number of schools in unison with the society is 11,909, with 1,110,730 scholars. The *British and Foreign School Society* was established in 1808, and took its rise from Joseph Lancaster's efforts to provide for the poor in Southwark, London. The *Home and Colonial School* was founded in 1836. These are the three great institutions which were represented in the exhibition.

It is estimated that, in 1858, there were 2,552,000 children in the day schools in England and Wales, 1,692,000 in public and 800,000 in private schools. This gives 1 in 765 as the proportion of the whole population under instruction—exceeded in Europe only by Prussia, which has 1 in 627.

Objects exhibited: Books and apparatus very extensively, geography, diagrams and pictures, drawings and designs, education of the blind, toys and games, specimens and illustrations of natural history and physical science, &c.

The jury speak well of the exhibition, as showing the public sympathy in the last decade with education far more than any results or improvements which are displayed in the exhibition. They urge that a far more systematic and complete exhibition of educational works and appliances should be had.

I have alluded to this subject, as I deemed it important that we should be more acquainted with what is being done abroad, and I have no doubt that this brief collation will surprise very many as to the attention which is paid to education in foreign countries.

Class XXX. Furniture, Upholstery, Paper Hangings, &c.

United States exhibitors, I. F. Pickhandt, New York, extension sofa; F. M. B. Bertram, New York, two reception easy rocking chairs, a very great curiosity in England, as a rocking chair is seldom seen. Dr. W. H. Boyle, California, a new dental chair, very ingenious and useful, both for operator and his subjects. Would that there had been a barber's chair, an article almost unknown even in their principal cities.

The exhibition of furniture, paper hanging, etc., was very extensive, and a very great improvement as to furniture in the English department, they having greatly improved their style of furniture since 1851. England, France, Italy, Hamburg, Austria, Rome, Belgium and Prussia were among the largest exhibitors.

Class XXXI. Hardware.

The manufactures in iron, brass, copper, tin, etc., were excellent, and the principal countries in the exhibition were well represented. The jury in this class made an especial report *on education!* Rather a singular jury for education. It was, I think, opposed to the general report made by the jury on education—particularly, I think, relating to the schools in Great Britain.

Class XXXII. Steel, Cutlery, and Edge Tools.

W. Blackwell & Co., 9 Cranbourne street, London, exhibited American tailors' shears, admitted, so far as I could ascertain, to be superior to all others. Messrs. Blackwell & Co., who carried on the business of manufacturing tailors' shears for many years, have given it up, and sell Hendrick's (N. Y.) American shears, on account of their great superiority in lightness, strength, elegance of shape and power of retaining the cutting edge, as we were advised.

This whole class was a very interesting one. It was one of the most complete exhibitions made, and the English articles were admirable for finish and style, and there was great excellence in the articles shown by several of the continental nations.

Class XXXIII. Jewelry, &c.

Two exhibitors from the United States.

W. H. Green, Mendon, Conn., new revolving castor; a very clever article.

J. Brown & Co., New York, sample of plated lockets; very neatly made and quite attractive.

This class, ever attractive, was peculiarly so in this exhibition, and the wealthy of every nation purchased largely of the high prized articles exhibited by most of the nations represented.

Class XXXIV. Glass

United States, one firm exhibited, *Hartell & Letchworth*, Philadelphia, samples of glass jars for sealing fruits and preserves; a very useful and economical article.

American Bank Note Co., exhibited samples of very beautiful engravings for designs, executed by machinery, called lathe work.

Stained glass was much in advance in 1851, especially in the English department. The ordinary glass, for household and fancy purposes, was very much in advance in some countries.

Class XXXV. Pottery.

A small exhibition of earthen, China, and decorative pottery and porcelain, which was very attractive.

Class XXXVI. Dressing and Traveling Cases.

A collection which might have been dispensed with in an exhibition like this, without disarranging the exhibition.

Fine Arts.

This was an entirely new feature of the exhibition, and proved very attractive, embracing the finest paintings, statuary and engravings from all the principal galleries of the continent and Great Britain. Here, without the expense in traveling over Europe, and being raced through the picture galleries, might be found many of the most celebrated works of art which the world has ever known, which could be examined at leisure, and comparison could be here made which could not be done in detached galleries. The show in the British division was a very interesting one, and vastly superior, I should judge, to what was generally anticipated.

France showed largely and splendidly, as did Italy, Austria, German States, Belgium, &c.

The United States had in statuary *Storey's* two works, which were unsurpassed in the exhibition. *Mosier*, also, had several very choice statuary, and *Miss Hosmer*, as a female artist, I think, had no superior.

Cropsey's "Autumn Scene," on our own Hudson, a landscape painting, was a very attractive picture, which did great credit to our country, and which passed into the gallery of some noble English gentleman, at a price, we believe, quite satisfactory to Mr. Cropsey, than whom there was no more intelligent and faithful representative of our country in the exhibition.

In closing this report, I am fully sensible that we have much yet to learn, as is shown in this great exhibition, and there was much, if rightly improved, to benefit our country. Those who were present and carefully

examined the contributions on exhibition, cannot fail to have seen that very much remains for us to learn from the nations there represented; and I shall be much mistaken if we do not avail ourselves of what was there exhibited, which may be introduced here to advantage to our own country. Although our representation was much less than in 1851, still it was in the main of such a character as to attract the special attention of the jurors, whose awards testify to the great value of our inventions, and will lead, I have no doubt, to extensive orders from other countries.

From, the general expression among those present from other nations, it is evident that exhibitions of this character will continue to be held among the different nations, and, as the field of these exhibitions embraces the world, it is manifestly of great importance that our country should be fully represented. We shall be amply repaid for any reasonable outlay that should be made to defray the expenses of the exhibitors.

I connot, in justice to myself, omit to bear testimony to the kind attentions extended to our department by Her Majesty's Commissioners and the Executive committee, and also to Dr. Lyon Playfair, commissioner of the jurors, Professor P. C. Owen, superintendent of the foreign department, and F. R. Sandford, Esq., secretary and general manager, with whom we were in constant communication, and whose efforts were untiring to oblige the exhibitors in their arrangements—such as to secure, as far as was practicable, a thorough and satisfactory examination of everything presented for the examination of the jurors.

To His Excellency Mr. Adams, United States Minister, we were much indebted for his active co-operation. His weekly receptions enabled us to feel at home, as here we met gentlemen and ladies from our country who sympathized with us in the state of affairs at home. The American consul, F. H. Morse, Esq., and the assistants of Mr. Adams, were unremitting in their unwearied endeavors to aid us in preparing the building for the display of our articles, and in various other ways.

Dr. J. R. Black contributed to our success; though long a resident of London, he has not forgotten his native country. We found him, as in 1851, a most valuable and discreet friend and counselor, and we owe very much of our success to his wise and discriminating counsels, which were ever freely extended to us.

To J. F. Cropsey, Esq., artist, now a resident in London, who was constantly devoted to the exhibition, and who also contributed greatly to our success, we owe many thanks. United with Dr. Black in all matters relating to our division, their labors were most valuable. To these gentlemen, in connection with Joseph E. Holmes, Esq., the Assistant Commissioner, we are indebted for the successful carrying out of the plans adopted for our exhibition, and the gratifying results of their labors will bear to them its highest rewards.

I deem this tribute justly due to these gentlemen for their most valuable and efficient aid.

It is most gratifying to be enabled to give the testimonial from Earl Granville to the commission from the United States, showing that our efforts to insure success to the exhibition were duly appreciated.

B. P. JOHNSON, *United States Commissioner.*

List of those to whom awards were made in the United States department, as appears from the book of awards, published by Her Majesty's Commissioners, and subsequent corrections.

CLASS I. MINING, MINERALS, &c.

Thomas Meads, Lake Superior, cabinet copper and silver ore.. Hon. mention.
New Jersey Zinc Co., Spiegel iron produced from Franklinite, do
J. Morshimer, Commissioner from Nevada Territory, silver and gold ores, &c., from the celebrated Washoe mines.... do

CLASS II. CHEMICAL SUBSTANCES, &c.

F. S. Pease, Buffalo, N. Y., refined petroleum and lubricating oils, &c..... Prize Medal.
Glen Cove Starch Co., New York, samples starch, &c..... do
Kingsford, Oswego, N. Y., silver starch..... do
H. G. Hotchkiss, Lyons, N. Y., wintergreen oil..... do
Alfred Hall, Lyons, N. Y., oil peppermint.....Hon. mention.
Section B, Philadelphia College of Pharmacy, American vegetable drugs, &c..... Prize Medal.

CLASS III. SUBSTANCES USED AS FOOD, &c.

Hecker, Bros., N. Y., superior wheaten flour..... Prize Medal.
Stebbins & Co., Rochester, N. Y., barrel superior flour.....Hon. mention.
Glen Cove Starch Co., N. Y., samples corn flour called "Maizena."..... Prize Medal.
J. Waddell, Springfield, Ohio.....Hon. mention.

CLASS IV. ANIMAL AND VEGETABLE SUBSTANCES USED IN MANUFACTURES.

F. S. Pease, Buffalo, N. Y., collection of oils, chiefly animal.. Prize Medal.

Sec. B. Perfumery.

H. G. Hotchkiss, Lyons, N. Y., essential oils. (Mr. H. exhibited oils in 1851, and received prize medal; and their reputation was fully established in this exhibition. See Class 2.)
A. Hall. Lyons, N. Y., essential oils. (See Class 2.)

CLASS V. RAILROAD PLANT, &c.

No exhibitors.

CLASS VI. CARRIAGES, NOT CONNECTED WITH RAILROAD OR TRAM ROADS.

Brewster & Co., New York, phæton..... Prize Medal.
Blanchard & Brown, Springfield, Ohio, wooden wheel, spokes machine-made..... do

CLASS VII. MANUFACTURING MACHINES AND TOOLS.

Wheeler & Wilson, New York, sewing machines..... Prize Medal.
A. Howe, New York, sewing machines..... do
I. M. Singer, New York, sewing machines.....Hon. mention.
Willcox & Gibbs, New York, sewing machines..... do
C. R. Goodwin, by Bigelow, Boston, sewing machines..... do
Alexander Smith, West Farms, N. Y., power loom for weaving tufted fabrics..... Prize Medal.
Sanford & Mallory, N. Y., flax and fiber dressing machine....Hon. mention.
G. H. Sanborn, cord and rope making machinery..... do
W. D. Richards, improved boot and shoe machinery..... Prize Medal.
P. H. Wemple, Albany, N. Y., machine for boring slats, blinds, &c.....Hon. mention.
Blake & Bros., New Haven, Conn., stone-breaking machine.. Prize Medal.
Fred. Otto Degner, New York, printing press.....Hon. mention.
Edward Conroy, Boston, cork-cutting machine..... Prize Medal.

CLASS VIII. MACHINERY IN GENERAL.

F. E. Sickles, New York, steam steering apparatus..... Prize Medal.
John H. Allen, New York, horizontal iron condensing engine, do
W. D. Andrews, centrifugal pump and engines..... do
Capt. John Ericsson, New York, caloric hot-air engine..... do
A. G. Gibson, improved carriage coupling..... do
John C. Gore, Jamaica Plains, Mass., belt shifter..... do
C. L. Goddard, New York, mestizo burring picker..... do
T. Hansbrow, California, pumps..... do
Kershaw & Colvin, Philadelphia, cow milker..... do
Lee & Larned, N. York, steam fire engine..... do
C. Near, N. Y., self-registering dynamometer..... do
D. Parker, Canterbury, N. Hampshire, washing machine.... do
Brothers Peasant, Ericsson's hot-air engine..... do
C. T. Porter, Auburn, N. Y., invention of governors..... do
Richards, Hartford, Conn., exhibited by C. T. Porter, indicator for engines, &c..... do
J. Ross, Rochester, N. Y., conical burrstone mills..... do
Henry Steel, Jersey City, steam pump..... do
S. Wilcox, jr., Rhode Island, hot-air engine..... do
R. H. Worthington, steam pump..... do
C. H. Denison, Wilcox's hot-air engine.....Hon. mention.
John Dickenson, diamond mill-dresser..... do
J. J. Eckel, N. Y., combination press and corn presser for cotton, hay, &c..... do
A. M. Foote, New York, a lock umbrella stand..... do
H. H. Parker, ratchet drill..... do
—— Walcott, button hole cutter..... do
Walker & Effenstein, portable mineral and soda water apparatus..... do
Wentworth & Jarvis, windmill, water elevator and regulating power..... do

CLASS IX. AGRICULTURAL AND HORTICULTURAL MACHINES, &C.

Cyrus H. McCormick, Chicago, Ill., reaper and hay raker... Prize Medal.
Walter A. Wood, Hoosick Falls, N. Y., reaper and mowing machine and grass mower..... do
Russell & Tremain, Fayetteville, N. Y., reaper and mowing machine.....Hon. mention.
Kirby & Osborn, Auburn, N. Y., Kirby's combined reaper and mower, and mower..... do
Douglass Axe Co., Mass., axes and wood working tools..... Prize Medal.
Wentworth & Jarvis, Burlington, Iowa, automaton farm gate and windwill, (on windmill).....Hon. mention.
Levi A. Beardsley, South Edmeston, N. Y., hay and earth elevator..... do
Robert Price, Albany, N. Y., churn and mop, (on mop)..... do
Batcheller & Son, hand tools..... Prize Medal.
Blanchard & Brown, cotton planter..... do
J. F. & W. Dane, Ohio, steel plows..... do

CLASS X.

No exhibitor.

CLASS XI. MILITARY ENGINEERING, &C.

Colt's Patent Fire-arm Manufacturing Co., Hartford, Conn., guns and pistols..... do

CLASS XII. NAVAL ARCHITECTURE, AND SHIPS, TACKLE, &c.

W. H. Ward, Auburn, N. Y., day and night signal telegraph ..... Prize Medal.

CLASS XIII. PHILOSOPHICAL INSTRUMENTS, &c.

Darling & Swartz, Bangor, Maine, steel rules, measures, &c., do

CLASS XIV.

Busts of Governors of the several States, U. S.....Hon. mention.

CLASS XV.

No exhibitor.

CLASS XVI. MUSICAL INSTRUMENTS.

Steinway & Sons, New York, pianos ..... Prize Medal.
G. H. Hulskamp, do do ..... do
do do violins..... do

CLASS XVI. SURGICAL INSTRUMENTS.

Dr. Robert Bates, Philadelphia, Penn., mechanical appliances for curing stammering..... do

CLASSES XVIII, XIX, XX.

No exhibitor.

CLASS XXI. WOOLEN AND WORSTED GOODS.

Manchester Print Works, New Hampshire, delaines..... do

CLASS XXII.

No exhibitor.

CLASS XXIII. WOVEN AND SPUN FABRICS, &c.

Manchester Print Works, New Hampshire, printed fabrics... do

CLASS XXIV.

No exhibitor.

CLASS XXV. SECTION B.

Wilkins & Co., New York, curled hair and bristles.....Hon. mention.

CLASS XXVI.

No exhibitor.

CLASS XXVII.

Section B.—R. A. Tilghman, Philadelphia, fatty acids from aqueous saponification ..... Prize Medal.
Section C.—Manchester Print Works, woolen hosiery.....Hon. mention.

CLASS XXVIII. SECTION B. STATIONERY, &c.

S. Sweet, New York, process producing blocks for printing.. Prize Medal.
C. M. Saxton, New York, process sealing official documents. do
American Bank Note Co., New York, variety and excellence of bills ..... do

CLASSES XXIX, XXX, XXXI.

No exhibitor.

CLASS XXXII. SECTION B. CUTLERY AND EDGE TOOLS.

W. Blackwall, London, American tailors' shears..... Prize Medal.
Douglass Axe Co., edge tools, (see Class IX.)..... do

British Colonies and Dependencies.

The British colonies and dependencies were largely represented, and their contributions were of great excellence. A brief description of them may be interesting.

They were in general very well represented, and much more extensively than in the former exhibition. We give a brief sketch of the contributions from the colonies, which add so largely to the wealth of the mother country, from an English journal. We commence with Canada.

On entering the eastern transept there is a large "trophy" built of large sections of logs, piled one over another, in five tiers, rising almost to the roof. This striking erection was contrived of necessity, there being no wall or floor space to display the great varieties of wood to be exhibited. It is in the variety and size of its native woods that Canada is chiefly remarkable. Her forests, of 2,000 miles in length, produce trees of immense size and endless variety. There are here 200 different kinds of timber, most of them from trees which grow to a height of 150 feet, averaging eighty feet in straight length of trunk, before reaching a limb, and sometimes, as in the case of specimens here exhibited, 120 feet of branchless trunk. The timber is shown in every stage, from sections of the trunk with the bark, to square logs; from that to planks, and then to polished surfaces. Of the more valuable woods, the black walnut, the bird's eye maple, and the white cedar take on a most beautiful polish; and of woods specially adapted for furniture and carpentry, there are here about 200 varieties. Some of the logs are seven feet in diameter; but timber is too plentiful in Canada to tempt the colonists to fell these giants of the forests for ordinary purposes, when they can get logs more manageable for their saw mills. Besides the timber, the twigs, leaves and flowers of the various trees are shown in properly classified order, as also the tools which the woodsmen "lift up thick trees upon." The familiarity of the Canadians in handling wood appears in the kind of axe they use for splitting it. Nothing is more common in England, when wood is to be split, than to find the helve sticking in the piece it was intended to go through. This never happens with the Canadians, for all their axes are constructed with a peculiar bulge in the center which effectually prevents any such annoyance.

Among the more interesting of the articles made of wood are two models of railway cars, one sixty feet long, intended for goods and cattle, and the other, nearly ninety feet long, designed for passenger traffic. The passenger car is fitted up like the deck saloons of some sea-going steamers, with beds, dressing rooms, stoves, and every convenience of a well furnished dwelling house. There is also a string drawn through each carriage for communication with the driver, in case of emergency, and we are informed that no inconvenience is caused by this accommodation. The beds are so arranged as to suit either single persons or couples, and when removed in the morning are conveniently stowed away at the ceiling. Traveling some 1,000 miles occasionally at a stretch, these sleeping cars must be part of the necessary accommodation of railway travelers in Canada; but any one who has traveled from London to Aberdeen, or even Edinburgh and Glasgow, by night train, without a break, would probably

feel thankful if our own railway companies had the consideration to provide similar comforts on their lines.

The iron work, as well as the carpentry and upholstery of the Canadian railway cars, would appear to be superior. A couple of wheels and axle are shown, which have traveled over 150,000 miles on the Grand Trunk line, with very little wear indeed. The tires are of iron, but very hard and dense. In the Canadian department there is exhibited a quantity of strong and serviceable agricultural implements, with specimens of native granites and other stones, wheat, Indian corn, starch, arrowroot, flax, cigars, mustard, beeswax and furs. There is a case of preserved fishes, of which immense shoals are found in the lakes, and preserved specimens of about 200 varieties of native birds, of which about forty are ducks of different kinds. With a climate corresponding with that of Europe, from the latitude of Rome to the North Cape, there are, as may be supposed, great variety of fruits, of which representations are here given. Forty varieties of apples are depicted, about as many of pears, and representations, in the natural size and color, of peaches and grapes grown in the open air. The exhibition from Canada is a very creditable one. We were informed by the President of the Canadian Agricultural Society, who was one of the jurors, that the exhibition would have been very much larger had a suitable appropriation for expenses been made.

Of the other colonies, Victoria is most largely represented in this exhibition. This is partly owing, perhaps, to the occurrence of the Victorian Exhibition of 1861, from which many of the choicest specimens were selected for the International Exhibition. The most interesting object, perhaps, in this court, is the apex of a pyramid, forty-four feet nine and one-quarter inches high, and ten feet square at its base, exhibited at the Victorian Exhibition last year, to represent the quantity of gold exported from Victoria from the 1st October, 1851, to the 1st October, 1861, viz.: 26,162,432 ozs. Troy, equal to 1,793,995 lbs. avoirdupois, or 800 tons 17 cwt. 3 qrs. 7 lbs., equal in solid measurement to 1,492½ cubic feet, and of the value of £104,649,728 sterling. The Victoria court is, like all the other colonies, in the eastern transept, and the entrance to it is through a great portico formed of large bales of wool, piled up to form piers, carried across to form the entablature, and raised in a semicircle over all, to represent the archway. Gold is now the leading article in Victoria, and it is said 10,000 ozs. of it is the amount shown. A quartz-crushing machine was on exhibition, and the process of washing out the gold was exhibited and in operation most of the time. A large vessel nearly filled with gravel and other materials from the gold formation, and covered with water, is operated upon by a gold digger with a pan and long handle, with which he digs up from the bottom, and when the water is exhausted the shining particles of the precious deposit are found, and many a spectator, we doubt not, would have been willing to change places with the digger, for a short season at least.

Of agricultural products, some extraordinarily fine specimens were exhibited. Wheat as fine as we have ever seen, weighing sixty-nine pounds and four ounces per bushel, was exhibited, the produce of this colony, and a large variety of other articles.

Tasmania is located adjoining Canada, and has a fine collection of wood, coal and other articles.

New South Wales produces sea island cotton, grown at Hunter river. Its quality is fine, though not equal to American sea island. The exhibition from this colony is very extensive—wheat, Indian corn, fruits preserved, and among the apples very large specimens, almost equal to California. Among them we noticed several American varieties, much larger than the fruit grown in the Northern States. Wine was shown very extensively. A fine collection of stuffed animals was exhibited.

From *Queensland* there is a large glass case of birds and native grasses, very tastefully grouped. The implements of the aborigines are also shown, and a great variety of woods. Native cotton is shown, raw and manufactured, and wool, also in both states; among the woolen fabrics are some plaids in the Scotch style. Furs, soap, oils and minerals have also a place.

In the *South Australian* court there was a very interesting and complete geological collection, and larger specimens of marbles and minerals, including silver, lead ore and some magnificent lumps of pure copper ore. Wool is also exhibited, along with a great many different kinds of fruit, including all our garden fruits, and others grown in more genial climates. A specimen of mechanical invention is shown in the shape of a reaping machine, which, if not equal to some in this country, is very creditable to an inventor who has not the opportunity of seeing frequent matches of reaping machines.

Nova Scotia has a fine collection of stuffed birds and a large elk, but not equal in size to the specimen in the museum at Albany, United States. There are specimens of the colonial gold, the quartz in which it is found, and a gold-washing machine. Among the manufactures of the colony are hides, furs, muffs, ships'-tackle, plows and many agricultural implements, upholstery and furniture, and a sample of a very handsome carriage. In the food department the Nova Scotia red herring have of course a first place; and then comes salmon, cod, mackerel and other fish, monster lobsters, maple sugar, honey, bears' grease, &c. Among the natural products are specimens of the oil coal, and a pillar of common coal in section, between 30 and 40 feet high.

New Brunswick is rich in tools and agricultural implements, and among its raw produce exhibits coal and many varieties of wood. Among the curiosities in this court is the war dress of an Indian of the Melaceet tribe, from which it would appear that savage nations resemble civilized, or, perhaps, we should rather say, civilized resemble savage nations in surrounding the soldier with all the trappings of gayety and glory.

Prince Edward Island is also represented by Indian corn among its raw produce, and among its manufactured articles a reaper, a model of a saw mill, harness, cheese, &c.

Jamaica occupies a good deal of space in the exhibition. Among the manufactures in this court, there are dish mats and other articles made of cocoa nut fiber, and window blinds made from the ribs of cocoa nut frond. Among the raw produce, there are rice, limes, oranges, guano, spices and tobacco, and a great variety of parcels of cotton, from which it would appear that the Jamaica planters are beginning seriously to contemplate

cotton as one of the crops most likely to prove lucrative. There are also specimens of a number of native mineral ores—iron, copper, lead, zinc, cobalt, lime, sulphur, &c.

British Guiana sends a few of her natural products and a very attractive case of preserved birds and monkeys, with a number of beautifully large and brilliant butterflies. In the same section there is a model of a barn by an Indian up the Berbice river; it shows a large amount of mechanical ingenuity.

India shows carving of inlaid work on the ebony and ivory bones and cabinets, and other furniture, and is exceedingly beautiful. The specimens of India shawls, crape, &c., are also very superior, as well as the silver and gold ornaments and the ornamental armor. A great number of specimens of cotton are shown, a large variety of flax and its products, and silk, raw and manufactured, with specimens of the silk-producing insects. The Cotton Supply Association of Manchester exhibit in this department twelve beautiful webs of prints, manufactured exclusively from Indian cotton. There is no section of the exhibition so complete and perfect as the Indian, and no country of which one can get so vivid an idea from the minute and thorough way in which the whole employments and habits and customs and circumstances of the people are exhibited in models or pictures, or specimens of their dress and handicraft. Of the physical condition of the country an admirable idea is given by a very large relievo map or model of the whole peninsula.

From *Ceylon* there is much the same sort of articles as from India—specimens of fine work in ebony, ivory and shell, with specimens of raw cotton and of the satin wood and other woods.

AFRICA.

Liberian Republic.—The articles composing the Liberian court at the late International Exhibition have been disposed of by President Benson. Some are to be sold, others are to be given to friends of the republic, and sixty specimens, or nearly one-half, are to be presented to the African Aid Society of London. It is stated that the latter purpose to make them the nucleus of an African museum. It was designed to utilize the superior collection in the United States, but the preparatory steps were undertaken at too late a moment for success. The one hundred and twenty-three articles of which it was composed were highly indicative of the vast resources and commercial capabilities of the Liberian Republic. No country of the same extent, six hundred miles of sea frontage by fifty miles inland, yields a greater variety and useful character of produce, or possesses more latent wealth.

APPENDIX,

CONTAINING EXTRACTS FROM THE REPORTS OF THE JURORS, AS FAR AS RECEIVED, IN THE MOST IMPORTANT DEPARTMENTS OF THE EXHIBITION.

CLASS I.—MINING AND MINERAL PRODUCTS.

Never before, in the history of man, have the products of the mineral kingdom exercised within a brief period so momentous an influence on the fortunes of nations as that which in the last fourteen years has riveted the attention of the whole civilized world.

If we look back only to the date of our first universal exhibition, we find that a series of changes has been brought about, which, but for the potency of the effect produced by mineral substances, would have required decades of years if not centuries to accomplish. Coal, the great basis of manufacture and locomotion, has been extracted on a scale never before contemplated, and sought for and found in new countries and under new conditions with something like equal strides; it has also been made to yield a variety of products brought with unexampled rapidity into the applications of daily life. Iron and steel have been manufactured in masses and applied to purposes equally unknown in former times. Metals scarcely known except by name, in 1851, have become the subjects of operations of commercial importance. And lastly, the succession of gold discoveries in so many widely separated and enormous regions has led to the exploration and settlement of vast tracts by myriads of men, with a facility which was impossible before the extended use of iron and coal had smoothed the way for so gigantic an emigration.

There is, then, at present no necessity for commencing, as in 1851, a report on Class I with an apology for the uninviting appearance of the objects which compose it. A great number of them are of course only to be properly appreciated by those who have made such substances their study; but whilst some cannot but attract the eye and excite the thoughts of the most incurious, the great bulk of them are far more likely now than formerly to command the attention of the better informed portion of the general public.

That a high degree of interest is by the producers of mineral attached to the appearance of their products in the exhibition, is proved by the great numbers who, both in Europe and in our most remote colonies, have contributed their quota to the present display. The result is such a series of collections so ample, and affording such an opportunity for comparison, as the world has never before seen. Amid these manifold groups of objects it will be at once observed that certain of them have been exhibited with a very direct view to self-interest; that they, in fact, form excellent advertisements. But a large portion of the samples and illustrations of the mineral kingdom have been contributed by persons and by companies who can derive no pecuniary gain from the exhibition, and who have incurred

labor and expense for the honor of their craft, or from the desire to spread information, coupled with the worthy ambition of adding to the fullness and value of their national part in the friendly concourse in which all the world had been invited to join. In adjudicating upon the articles submitted to them, the jury, whilst adhering to the rules laid down for their guidance by the commissioners, and forming their conclusions principally from the character of the objects exhibited, have nevertheless found it necessary to attach some weight to the conditions under which those objects were produced. They have therefore held that in many cases where a mere natural product of good quality is exhibited, its very exhibition is, like virtue, its own reward; and unless it be accompanied by documents or statistics, rendering it serviceable to the progress of knowledge, they have considered it less deserving of honor than those collections, or even single objects, which tell of the employment of intellect or years of assiduous labor. Sometimes the line of demarcation has been easy to draw, but at others some difficulty has been felt in defining how far the actual exhibited objects might be taken as types or representatives of the works where they were produced; and this, not unfrequently from an absence of systematic arrangement or of illustrative documents, has thrown on particular jurors an unusual *onus* of responsibility.

A principal ground of doubt and debate, in dealing with Class I, lies in the necessarily incomplete character of any exhibition, however extensive, with reference to all those important varieties of circumstances under which minerals and their products are obtained. It must be remembered that from the nature of the trade in metallic ores, the workers of mines gain no pecuniary advantage by exhibiting, and we can scarcely expect that a large proportion of them will sacrifice time and money to the prospect of a very small modicum of glory. Here and there, and in particular districts on a large scale, we may see exceptions to this rule, where specimens of certain ores, and sometimes their metallurgical products, are exhibited for the purpose of bringing a new locality into notice, of attracting the attention of capitalists, or forming a joint stock company out of the body of the public. To these motives we are undoubtedly, in 1862, indebted for some very interesting assemblages, but an unusual degree of caution needs to be exercised in dealing with them. Where works of acknowledged importance have once been thoroughly established, exceptionally fine specimens may be sent for exhibition, and their bearing and relation to the ordinary products will be understood; but specimens of unusual magnitude or of engaging appearance may in other instances be put forward as samples, which perhaps give the exact reverse of a true impression, and ought, if a rigorous justice could be carried through, to be marked with a label warning the unwary.

I.—Geographical and Topographical Maps and Models, and General Collections.

It has commonly been observed that the practice of an art precedes the scientific investigation of the phenomena upon which it depends, and that ultimately scientific knowledge aids in the extension and improvement of the art. In none is this more striking than in the relation between the

sciences of mineralogy, geology, and chemistry to the arts of mining and metallurgy. The first accurate observations on minerals and the succession of rocks, emanated from Swedish and German miners; but the successive investigations of a host of zealous laborers in the same field have, after the lapse of a century, produced results of a kind and magnitude little anticipated by the early explorers of the inorganic world. Thus also in one particular department of the subject, the exploration by practical miners of districts remarkable for mineral wealth, led to the construction of partial mineral plans, or supplied the necessary data for more ample geological maps; but the progress of geology within the last forty years has so clearly shown that great benefit can be conferred on the industrial arts by an accurate study of the structure of the crust of the earth, that there is scarcely a civilized nation which has not established a geological survey conducted under the auspices of the State.

Until an accurate geodetical map on a sufficient scale has been prepared, it is out of the question to establish a satisfactory geological survey. Owing to a variety of causes, some countries have in this respect lagged far behind others, and in some of the colonies, where mineral wealth has of late years been a subject of absorbing interest, the two classes of survey have been carried on almost simultaneously. The jury, therefore, looking to the high importance of these primary operations, has considered it right to signalize certain geographical maps and models as contributing valuably to the understanding of the physical structure of the districts.

The United Kingdom.—The geological survey of the United Kingdom, commenced by the late Sir Henry De la Beche, with a very slender staff, and now continued under the superintendence of Sir Roderick Murchison, with a strong corps of assistants, has enormously extended since 1851 the area of its accurate investigations. Even in 1855, when exhibited at the Paris Exposition Universelle, this work was pronounced by all competent judges to be unrivaled; and since that time, some of the most important mineral districts in the three kingdoms have been surveyed and added. The great map suspended in the eastern annexe gives the sum of the work as far as it can be rendered on a ground plan, whilst very numerous sections and illustrative notes have been issued for the explanation of the structure of particular regions. It is based on the excellent and generally convenient map of the Ordnance Survey, on the scale of one inch to the mile, or $\frac{1}{63360}$. Besides this, there are exhibited a map of the Lancashire coal-field, in the scale of six inches to the mile, or $\frac{1}{10560}$, an excellent delineation of a most valuable district, executed by Mr. Hull, and some sheets on a similar scale of the south of Scotland, by Messrs. Howell and Geike, under the direction (as well as the English part) by Professor Ramsay. The survey of Ireland, commenced much more recently than that of England, and now under the direction of Mr. Jukes, exhibits maps on the inch scale, which, reduced from working maps on the six-inch scale, give the details of the geology of the southern half of that island, for which an excellent general map had before been constructed by Sir Richard Griffith.

Victoria.—Great activity has been shown by the government of this colony in aiding the development of its astonishing mineral resources.

Canada.—As in the years 1851 and 1855, Canada is distinguished for the

systematized completeness of her collections. A long series of all the useful minerals is arranged and amply catalogued by Sir William Logan, the unwearied director of the Geological Survey. It is followed by the crystalline rocks, both metamorphic and intrusive, grouped after a somewhat novel system by Mr. Sterry Hunt, and accompanied by very valuable notes, the result of long years of observation and of chemical analyses. The map and the reports, and the decades of Sir William Logan and his associates, have contributed so greatly to the advancement of general knowledge, as well as to the development of the colony, that the jury awarded three medals; one to the officers of the survey, for their excellent published works; one to Mr. Sterry Hunt, in recognition of his services to chemical geology; and one to Dr. Billing, for his useful descriptions and plates of the fossils of the ancient formations of the country.

Belgium.—The geological map of this country, prepared with so much attention to detailed subdivisions, by the the late M. Dumont, is well known. They are shown (the larger maps on the scale of $\frac{1}{160000}$, and a smaller one) along with a most extensive series of rocks and minerals, which affords the opportunity of gaining at once an insight into the mineral structure of this industrially important region. The collection, which reaches 1195 numbers, is an excellent introduction to the subsequent examination of particular areas or works.

Denmark.—Several sheets of a beautifully engraved ordnance map are exhibited (on a scale of $\frac{1}{80000}$, reduced from a survey on a scale of $\frac{1}{20000}$.) Contour lines at intervals of 10 feet give an excellent picture of the slightly undulated surface. The neighborhood of Copenhagen is engraved on this latter scale, with contour lines at equi-distances of five feet.

France.—Before any other country, France, having the advantage of a trained corps in the State engineers of mines, saw the value of a geological survey of the entire country, and as early as 1841, a general map was published under the superintendence of the late M. Dufrénoy and of Elie de Beaumont.

The subterranean and hydrological maps of Paris (77 and 1251), by M. Delesse, are remarkable examples of beautiful work, illustrating the character of a limited district in such a way as can only be feasible in a large city or in a coal-field. The accomplished author of the map has selected certain important beds or strata known to lie beneath Paris, and then, guided by the very numerous borings made for water, and by other sources of information, has represented, by colored lines for each stratum, the zones of equal depth from a given plane, just as the form of the bottom of a lake may be contoured after a series of soundings have been made. The practical bearing of such a work, especially in a sanitary point of view, will be seen at once, when it is remembered that the course of all drainage and of water supplies may thus be traced; and it is thus alone that it can with certainty be decided how to reject impure and to retain unvitiated sources.

Austria.—Among the most remarkable of all similar labors is the series of geological maps of the various divisions of the Austrian empire. When we consider the extent of the monarchy, with the rugged and sparsely inhabited character of a large part of its surface, we cannot but admire the great intelligence and assiduity which have enabled a small party of State

geologists, assisted here and there by volunteers, to execute so great a work as they have accomplished within the short period dating from 1850.

The geology has been laid down on the publications of the Imperial Military Geographical Institute, in some cases on the detailed maps, in others preliminarily on general maps. The first four of the following list are on the scale of $\frac{1}{144000}$, or 1 inch to 2¼ English miles; and some little notion of the detail entered into in the unraveling of these mountainous regions may be given by the observation, that no less than 81 different colors are referred to in the index table attached to the maps:

1. Upper and Lower Austria.
2. Salzburg, the Duchy of.
3. Styria and Illyria.
4. Bohemia.

Four more are general maps, on the smaller scale of $\frac{1}{288000}$

5. Tyrol and Vorarlberg.
6. Lombardy and Venetia.
7. Hungary and Croatia.
8. The Banat of Temeswar.

The last two serve only more general purposes, being on the scale of $\frac{1}{432000}$, or 1 inch to 6¾ English miles, viz:

9. Transylvania.
10. Galicia.

Bavaria.—An atlas of very beautifully detailed topographical maps (233) is exhibited by the General Quartermaster's Staff, on the scale of $\frac{1}{50000}$; and the structure of the Alpine portion of the kingdon is further elucidated by a remarkably clear and distinct geological map, prepared under the direction of Bergmeister Gumbel, and published in 1858. This map very properly overlooks the vexatious interference of political boundaries, and gives a continuous view of the northern division of the Alps, from the Boden sea to Salzburg, uninfluenced by the strange irregularities of the frontier of the kingdom.

Prussia.—Amid a number of contributions to general knowledge, as well as to the development of the mineral resources of special districts, one of the most noticeable is the great geological map (805) of the Rhine Provinces and Westphalia, on the scale of $\frac{1}{80000}$, constructed by the distinguished miner and geologist, Von Dechen, who worthily holds the post of Oberberghauptmann at Bonn. Within this area, comprising several valuable coalfields, local surveys again on a larger scale have been instituted, to some of which we shall have to refer under another section.

Silesia is another important part of Prussia, the structure of which is instructively brought before us by the geological map (806) of Upper Silesia, on the scale of $\frac{1}{200000}$, exhibiting a long series of formations, commencing with a ridge of granite and syenite, supporting crystalline schists, and then passing to the coal-measures, singularly associated with red porphyries.

The Silesian map is laid down on the basis of that of Raymann, to which, as a very remarkable work, the jury cannot but call attention, although exhibited under Class XXIX. (1940), by the publisher, Fleming, of *Glogau*. It embraces all central Europe, on the scale of $\frac{1}{900000}$, divided into small sheets, of which 307 have been already completed, and is now being continued under the direction of Lieut.-Col. Von Oesfeld, of the Prussian army.

Switzerland.—Among all the maps in the present exhibition, none was found to be more worthy of admiration than the detailed map (434), with its expressive contour lines, of the Canton Glarus, by Professor Ziegler, so

well known for his other valuable contributions to geography. It is on the scale of $\frac{1}{50000}$; and its full minutiæ, coupled with its vigorous representation of the steep slopes and the crags of the higher ground, render it quite a model of mountain portraiture.

II.—Non-metallic Mineral Substances, Coal Excepted.

A very numerous corps of exhibitors have come forward on this occasion to represent the various rocks and minerals which are applicable to industrial purposes, and which are worked to an amount and value of which few persons have any true idea. At Paris, in 1855, our exhibitors in this section were greatly outnumbered by the French; on the present occasion the British Islands show a host in comparison, although France, Austria, and the Zollverein have all contributed a goodly number of objects.

Among the chiefly important substances which fall within this division are to be noticed—

1. *Stone suitable for building.*—In this department no particular discovery can be brought forward; but the subject is undoubtedly one of great interest, when we take into account the increasing magnitude of our public and private buildings, and the lamentable decay of those varieties of stone which have not been well selected. At no former time has there been so good an opportunity of seeing and comparing the materials of construction supplied by different districts and countries. It is impossible, among so many, to refer specially to more than a few; but whilst we have to omit the mention of many, and particularly of isolated specimens, it should be borne in mind that some of these may in themselves be of very good quality, but that appropriateness for use depends on many other circumstances than the characters of which we can judge in a specimen. Under this head will also come the slabs and slates, the use of which has been so much extended as, within a few years, to form one of our great branches of industry.

The hydraulic limes and cements were transferred for the judgment of the jury on Construction, Class X.

2. *Stones more particularly applicable to ornament;* as the polished hard rocks, granite and porphyry; the serpentines and marbles, some of which, advantageously placed for water-carriage, might doubtless be far more generally used than at present; the various minerals, silicious and calcareous, suitable for inlaying; and the rough gems.

3. *Millstones and Grindstones.*—France and England have hitherto stood far ahead of other nations in these respective materials; but we shall have to point to some remarkable discoveries in which other nations take a prominent position.

4. *Graphite or Plumbago,* now applied to so many purposes besides the original one of making the so-called lead pencils, and of which great and important discoveries have lately been made in various parts of the world.

5. *Clays,* which form a large article of commerce, including kinds applied to brick and tile making; fire clays which in some cases command high prices; clays for pottery; China clay or kaolin, adapted to the manufacture of porcelain.

6. *Salt.*—Rock-salt, with which is often placed that obtained from brine springs.

Slates, &c.—The great and increasing production of slates and slabs is principally confined to our western districts, North Wales, Cornwall, Cumberland and Westmoreland. That of North Wales is the most surprising in its history as well as its extent. In this mountainous region the older or Cambrian formation lies on the west, near the coast, and the slates, which are mostly distinguished by a purple tint, but are occasionally found green, are worked at a succession of quarries opened near Bangor, at Llanberis, and in the sides of the valley of Nantlle. The colossal traders in this material, Colonel the Honorable D. Pennant, and the representatives of the late Mr. Assheton Smith, have sent nothing to the exhibition, and the whole of this important Cambrian range is represented only by the products of a newly reopened quarry, Bwlch-y-Groes (49). But the formation next in order, the lower silurian, the slates of which are almost invariably of a blueish gray color, are exhibited in great perfection by the enterprising Englishmen, whose works are mostly situated near the little town of Ffestiniog. The fine quality of the material, the beauty of the natural split, or what geologists term *cleavage*, and the perfection of the dressing, are specially observable. As regards the material or "metal," the best examples are found to occur in the beds or "veins," which extend in a mountain semi-circle from Moel Wyn Bach, by Cwm Orthin to Rhiwbryfdir and Craigddu. The cleavage is exemplified in an unexampled degree by the thin, card-like slips, split in those natural planes of division at the quarries of Rhiwbryfdir and of the Welsh Slate Co.; and the dressing is an item which has been greatly improved during the last few years by sawing the blocks with circular saws, and by the introducing of machines, like that exhibited in model and patented by Mr. Greaves. Less than a century ago, the slates were only made of very small size, not much larger than the hand, whilst the production of large slate has in modern times become a *sine quâ non* of success. In 1782 only eighty men were working in the Penrhyn quarry; now no less than 3,000 find constant employment in that gigantic opening. At that period the Llanberis and Cilgwyn quarries appear also to have been wrought, but on an inconsiderable scale. With a view of showing the great increase of the trade within the last few years, we may compare the amount of dressed slates shipped at the sea outlets of the chief quarries in 1826 and 1861:

Shipping Port.	Quarries.	1826.	1861.
		Tons.	Tons.
Porth Dinorwic	Llanberis Valley	20,600	91,080
Carnarvon	Cilgwyn, &c., Nantlle	14,000	28,800
Bangor	Penrhyn, &c	about	100,000
Port Madoc	Ffestiniog	11,396	65,741

Nearly 9,000 persons are employed directly in the quarries of this single corner of North Wales; but other slate works are opened at intervals in the silurian rocks of a large area, as near Llanrwst, and north of Machynlleth, yet are comparatively unimportant.

FRANCE.—The country west and northwest of Angers, the border land,

indeed, of that same division of the Celtic race which inhabits our own slate bearing hills, yields to French commerce a large amount of slate of good quality, and of which the workings are reputed to be well managed. The examples which are exhibited are not, as it appeared to those who had been at Paris in 1855, taken from the best of them. Thus the exhibitors Maire (52 and 53) and Chalain (84) showed only slates of which the cleavage was inferior to those which have been described above, or in which the size was very small.

In the department of millstones the French have been hitherto unrivaled. No less than twelve exhibitors appeared. Among them the workers of the famous burr stone, or tertiary quartzite of La Ferté-sous-Jouarre maintained their wonted superiority.

Roofing slates are exhibited from several localities, some of them thin, but mostly small, and with a surface generally equal only to the Welsh "seconds."

Russia.—Among the most attractive of all the objects in the exhibition, are the ornamental hard stones sent from Russia, whether from their own beauty or the perfect workmanship, with the aid of which they are set out before the spectator to the greatest advantage. This is particularly observable with the series (6) from the cabinet of His Imperial Majesty. The gray jasper, the porphyry, the green nephrite, and the lapis-lazuli are probably equally striking to the mineralogist and to the lover of decoration. A very large block of the nephrite is exhibited by M. N. P. Albert (2), to whom otherwise a medal was awarded for his most remarkable exhibition of graphite, cut and carved into every variety of form, the fractures rough, the finished surfaces brought to a high polish, and the cases garnished with a number of views, interior and exterior, of the mines, which he appears to have opened with as much success as enterprise at Bogodolsk, in the district of Irkoutsk, in Siberia. The present position of the mine is the result of fifteen years of perseverance; and considering that a very high character is claimed for the quality of the graphite, the quantity raised, viz., 4,000 poods, or nearly eighty tons, is very considerable. A curious feature of its introduction into the commerce of the world, is its being transported by the River Amoor to the Sea of Okotsk. Equally remarkable in some points of view, if not in quality of the material, is the discovery of M. M. Sidorof (26), a merchant of *Krasnojarsk*, who discovered, in 1859, the outcrop of what appears to be a bedded deposit of graphite, many feet in thickness, on the banks of a tributary of the river Yenisei, about 300 English miles east of the town of Toorookhansk. These two great discoveries, for which medals were awarded, coming in addition to the actively worked Austrian localities above mentioned, and to what we have seen in this and former exhibitions, brought from Canada, Ceylon and India, leave no cause for anxiety as to the supply running short, but will render it a matter of moment for consumers to select the variety most suitable to their particular occupations.

III.—The Working of Mines.

The numerous methods and processes and appliances which rest on the application of divers sciences, and together constitute the art of mining,

are represented in the exhibition by a comparatively small number of objects, and give but fragmentary glimpses of a picture of the entire subject. For some among the most important illustrations the jury had to make incursions into other classes; and notwithstanding the great interest of many of the models and full sized mechanical appliances which were offered to inspection by various countries, it is to be feared that in this respect the general fullness of the collections is inferior to those of the exhibitions of 1851 and 1855. Not that the products of mining operations are scarce, or unsuggestive of the difficulties under which they have been won and worked, but that the visitor, desirous of acquiring knowledge, will find it to be obtainable only under certain isolated heads.

But as the art of mining forms the basis of most of our manufacturing industry, it is well to recollect how much we all depend for our daily comforts and our national position in the commercial world, on the economy of the processes by which our fuels and our metals are raised from their natural hiding places and brought into general circulation. A single example may suffice to show the magnitude and moment of these operations. It is obvious that in the numerous and more or less complicated operations of sinking shafts, cutting the coal, ventilating the workings, and raising the mineral, a crowd of items occur in which sound management has to be evinced, and in which a constant effort must be made to increase the efficiency and reduce expenses; now, an improvement which should have the effect of lowering the cost of coal only one penny per ton, would, from the gigantic output of our British collieries, effect a total saving of no less than £350,000 per annum. No step, then, however trifling in appearance, can be neglected; and in despite of the fragmentary character of the exhibition in this respect, we may learn a useful lesson by observing some of the prominent points to which the attention of the mining community has been directed, and in which we shall see that the last few years have been productive of a marked advance.

Sinking of Shafts.—The sinking of shafts through unsound ground and watery strata is notoriously one of the most serious operations in which man combats with natural difficulties. And yet, from year to year, as we exhaust of their mineral those areas in which it is easily accessible, we have to increase the number of endeavors to attain it at greater depths and under some of the overlying strata which are often saturated by large bodies of water. Thus in Durham the miner is driven to sink through the magnesian limestone and its base of quicksand; in Lancashire, in parts of Germany, and in the northeast of France, through the new red sandstone; in Westphalia and Belgium through the cretaceous rocks and that watery bed of "tourtia," to which several undertakings have entirely succumbed. Shafts sunk under these circumstances have cost from £50,000 to £80,000 apiece, and we shall therefore have to point out with pleasure some improvements which promise to aid materially in the opening of new tracts.

Ventilation.—As regards the important item of ventilation, we have to notice improvements first in the adaptation of the furnace, the ordinary method employed in Great Britain, and secondly in powerful mechanical ventilators, several of which have been established with good results, more particularly in South Wales, in Belgium and the north of France.

For the distribution of the air through the workings, the practice of splitting it into numerous runs, and obviating the necessity of a number of doors, has been gaining ground; and closely connected with this, the feasibility of rendering one division of the works independent of accidents in, or the more dangerous character of, other divisions has been more thoroughly established. Nor, although no great change has been introduced, has the construction of the safety lamp ceased to attract attention. The two requisites of a good light and an efficient means of locking the lamp, to prevent the removal of the safety gauze by unthinking workmen, have caused the exhibition of several modifications. In Great Britain the two favorite lamps are still the simple Davy and the Stephenson or "Geordie" lamp, both protected throughout by gauze; and the introduction of glass in the lower part of the lamp, for the sake of better light, is regarded with distrust. But the lamp of Mueseler, which gives so good a light that the temptation to open it is removed, has so well satisfied the miners of Belgium, that upwards of 22,000 are now in daily use in that country, and it has been successfully introduced into a few English collieries. The glass is of course liable to accident, but the statistics of the mines show that a glass lasts on the average for eighteen months, and it is stated that no single accident has been traced to its failure. Nót a few enthusiasts have upheld the plausible view that the use of the safety lamp should be enforced in and throughout all fiery mines; but there can be little doubt that, although some particular localities, as subject to irregular outbursts of gas, should employ no open lights at all, the majority of our mines may be so ventilated as to dispense with the use of the safety lamp, except in the getting of pillars and in testing the presence of gas. Whenever the safety lamp is indiscriminately used, there is some risk of neglect of ventilation, and the instrument that should be the means of enabling the collier to grapple with particular difficulties may be made the snare to lead him into general danger.

Previously to 1850 our statistics connected with these subjects were extremely defective; but in that year the government appointed three inspectors of coal mines, whose number has since been increased to twelve, and through whom we now obtain a series of valuable annual reports. It was expected by the over-sanguine that the appointment to this post of a body of men versed for years in the practice of their profession would at once reduce the number of casualties incident to the dangerous occupation of a collier. But it must be remembered that we are every year greatly increasing the scale of our operations, and gradually exchanging the easier for the more difficult conditions, whence there is no reason to doubt that the step taken by the government in the face of much opposition has produced good results. After another period of ten years it will be extremely interesting to make a comparison with the following summary of the inspectors' returns:

Total tons of coal raised in Great Britain in the 10 years, 1851—1860..	605,154,940
Total number of lives lost in ditto, ditto.....	8,466
Average tons of coal raised to each life lost.....	71,480

But so different are the circumstances under which the seams of coal are worked, that whilst in South Staffordshire only 30,000 to 39,000 tons are

raised for one life lost, in South Durham the proportion is as high as 130,000 to 180,000 for one life lost. Doubtless we must add to the difference of natural conditions the results of caution, of skill and of discipline.

Underground Conveyance.—A second and very important division of the subject is the conveyance of the mineral along the underground roads: here the more general introduction of edge rails of iron and horse power, and again of late years, in a few of our larger collieries, of engine planes, for the traction of trains of wagons, has accomplished important results. Not only is a great saving effected in the mere carriage, but it becomes feasible to work much larger areas from the same shafts, and thus to save the ruinous expense of repeated sinkings, or even to deal with those cases where a shaft would be out of the question, as where the minerals pass beneath the sea or an estuary.

Safety Cages.—Accidents from the breakage of ropes or over-winding against the pulleys are, although not so frequent as we might expect, nevertheless so numerous and so frightful in their effects that many efforts have been made to secure the lives of the men who may be riding at the time. In the exhibition of 1851 several contrivances appeared for this purpose, but neither of them appears to have fairly survived to the present day. Now, however, we have a crowd of inventions, safety cages (*parachutes*), British and foreign, most of them evincing a great amount of ingenuity, and undoubtedly acting well under favorable circumstances.

IV.—Coal and other Mineral Fuels.

An examination of the fossil fuels in the exhibition is suggestive of a change gradually taking place among the nations, and which is destined to acquire a much more pronounced character. Not only has the total quantity annually consumed been increased beyond all expectation, but new applications in manufactures have been invented, and materials little valued a few years ago command the highest prices of all their kindred. Only a few years ago and the nations of the south derided our evil-odored coal, and pitied us for its dirty smoke; now we have not only France and Prussia and Austria vying in the amount of mineral coal which they can raise, but Spain, Portugal and Italy assuring us that they produce some thousands of tons a year; and even the sub-tropical India and Brazil and Trinidad, proud to show that they have other means than the sun's rays of generating heat. Each country, in fact, puts in a claim to consideration, and tacitly appears to consider that the production of coal is more or less a criterion of manufacturing prosperity.

Steam engines by land and steam engines by sea have greatly contributed to this result; but it is in a dozen different directions that we must look for the causes of the wholesale destruction of our coal beds, which is indicated by the statistics of the last decennium.

In 1851 it was estimated that the British islands raised annually about 52,000,000 tons of coal, and calculations of the duration of the coal fields were based upon some such quantity; but we have already reached the annual amount of 84,000,000 tons, and there is little doubt that we must be prepared for a steady increase, notwithstanding the irregularities of the

advance, as seen by the following figures taken from the annual statistics compiled by Mr. R. Hunt, F. R. S.

Tons of coal raised in Great Britain and Ireland in the years—

1854	64,661,401
1855	64,453,070
1856	66,645,450
1857	65,394,707
1858	65,008,649
1859	71,929,765
1860	83,208,581

From the fact that mineral or stone coal was little valued but a few years since in most of the continental countries, the numbers representing their production have increased in a far more rapid ratio. The quality of many of the continental coals, and even of their brown coals, will surprise those who examine them for the first time; and the following statistics will show how important in each of the great manufacturing States of Europe this branch of industry has now become.

Again, the rapid communication of the present day so soon carries ideas and descriptions of processes over the whole civilized world, that we find natural substances, which a few years ago were hardly noticed, now everywhere the object of anxious search. Cannels and bituminous shales have in this country proved so valuable for distillation that almost every State in Europe now sends its examples of cannel, or brown coal, or bituminous schist, with its accompanying oils and paraffine.

United Kingdom.—The total quantity raised in 1860 is stated to be, inclusive of small coal burnt or wasted on fire heaps, 83,208,581 tons; of which upwards of 18,000,000 tons are from the single coal field of Durham and Northumberland.

V.—Iron.

Progress of the Iron Trade.—Already at the two great exhibitions of 1851 and 1855 a most prominent part of the task of the jury reporters was to expatiate on that great and growing wonder of the age, the production of iron. And now that a few years more have elapsed, we have but to increase our admiration for the still farther developed magnitude of the phenomenon, the influence of which is felt by every nation of the earth. Not even the most Arcadian districts, cultivating only the fruits of the earth, are free from its intrusion; not only do they need the improved agricultural implements of the newer time, but they all desire to export their produce, and can only effect that object by the aid of railways and steam engines. Whether for peace or for war, it is upon iron that we now place so firm a reliance, that the quantity of that metal produced by a nation becomes an index of its manufacturing power, and to some extent of its political greatness.

Some of the newer applications of iron have been made the subject of so much recent discussion, that in order to prevent the report from extending to an undue length, we need scarcely refer to them, except in passing under review the objects exhibited by the several countries.

It will be found that, during the last eleven years, a vast change has taken place, not in one alone, but in all the producing countries, simultaneously. We have, to be sure, in 1862 better means of fairly judging the

position of the trade than we had in 1851, from the far greater completeness of the collections; but the statistics of the different nations tell of themselves a remarkable tale. The advance has been not only, as might be expected, at various rates, but also more or less in different directions, according to the requirements of the various people and the character of the raw material upon which they operate.

Extension of the English method.—About the same time that the locomotive railway system was fully establishing itself in England, Mr. John Cockerill erected, under distinguished patronage, at Seraing, in Belgium, an extensive iron work, in which all the British improvements which have been the source of the great increase of production, were introduced and employed on a large scale. It was here that the puddling furnace and the rolling mill, the use of coke, and the hot blast, or, as it was termed in two words, the "English method," first came fairly into play on the continent. Hence, too, in a great degree, were taken the drawings and the models, and the parts of machinery which, in the course of a few years, supplanted in no small measure the older and more expensive methods of manufacturing iron, which had naturally retained their footing for a longer time in those countries where wood was cheap and coal was dear. The transformation is still in progress, but will probably never be entirely accomplished. Some few districts clothed with abundant forests will maintain the manufacture of a superior class of iron by means of vegetable fuel, even though it be made in comparatively small quantity and at high cost; but in others, as notably in parts of France, a mixed fuel is used; and in nearly all of them the use of hot blast, and the processes of puddling and rolling, have been adopted as valuable adjuncts.

Quality.—It is not long since a wide gulf of separation was held to exist between coke iron and charcoal iron, and again between that smelted with hot blast and that to which cold blast had been applied. But in the better class of works, increased care has been bestowed on the various operations, and the first mentioned distinction is no longer so sharp. A well made coke iron, smelted from good ores, may approach very closely to a charcoal iron, nay, for some purposes, may be even superior; and although the prejudice against hot blast in comparison with cold blast iron is not extinct, it would appear that where equal care has been bestowed on the selection of the raw material, and the manipulation, it is difficult to establish a difference.

Quantity of pig iron made in the following years, showing its great importance in Great Britain.

Years.	Tons pig iron.	Years.	Tons pig iron.
1800	180,000	1850	2,250,000
1825	600,000	1852	2,701,000
1830	678,000	1854	3,069,838
1835	1,000,000	1856	3,586,377
1840	1,396,400	1858	3,456,664
1845	1,512,500	1860	3,826,752
1849	2,000,000		

VI.—Metals, other than Iron.

Gold.—Resulting rather from accident than design, the production of gold from places successively discovered with extraordinary rapidity, has

been one of the most startling marvels of the middle of this century. At the time of the exhibition of 1851, Europe was already made acquainted with the character of the extensive *placers* or alluvial auriferous deposits of California; and that part of the community interested in metals was mostly aware that stream works of a similar kind had been in activity in Siberia for the last thirty years, and were yielding gold to the amount of some £4,000,000 per annum. But during that very year the discoveries were making in New South Wales and near Melbourne, which have metamorphosed all the commercial and social relations of those colonies, and have led to their playing so remarkable a part in the present exhibition.

The excitement, propagated first from California, beat with a strong pulse through all the newly settled countries; and in most of those where the surface crop of precious metal had not already been removed by the ancient inhabitants, it was found to exist, and sometimes in sufficient quantity to induce thousands of persons to quit their ordinary avocations and to labor in the hope of a rich prize at the gold fields, not only of Australia, but of New Zealand, of Nova Scotia, and of British Columbia.

The first finding of the gold in powder, in scales, and lumps concealed under a very variable thickness of loose detrital cover, has been almost everywhere followed up by its discovery disseminated or spangled in the matrix of veins which have a definite course, and continue downwards to unknown depths. The earlier work was of a very simple order—mere digging to moderate depth, and extracting by rude apparatus the most obvious part of the gold. In those days arose the jargon of "prospecting," and "nuggets," and "diggings," "reefs," etc., which, combined with the strange descriptions of persons to whom the whole subject was totally new, rendered it for a long while no easy matter to understand either the public or private reports. But a very short period passed before it was evident that these deposits were not spread uniformly over large areas; that they, in fact, occurred in patches or lines more or less regular, and that in some cases they required the execution of works involving skill and experience, and more elaborate apparatus for the prevention of loss of a great portion of the gold. Then came again the distinct evidence of the rapid exhaustion of these superficial repositories, and the necessity for seeking fresh ground of the same sort, or turning to the harder veins or lodes, in which a less easy harvest was to be made by actual mining operations. The present phase in the great gold producing districts, and one which will probably long remain, is the existence, side by side, of the various classes of undertaking, the stream works gradually spreading far and wide, or sometimes with improved apparatus reopening old localities, and the miners by degrees erecting machinery for testing the value of the veins in depth, and for extracting the precious metal from the large amount of stone with which it is mingled.

In the meanwhile the Old World has been far from unexcited on the subject. Not only has an enormous population emigrated in quest of gold, and large capitals been liberally, if not judiciously, sent across the world to assist in the developing of those distant tracts, but we have had at home our gold manias, which in 1853–5 led to the formation of various companies in England, and to a series of events not very creditable to the

intelligence of most of those concerned. For the production of Europe at large, but little has to be said; the old established localities continue to produce their small quantities, and notwithstanding various improvements, already referred to, of the apparatus employed, are unable to make any important advance in magnitude.

United Kingdom.—It would be out of place to mention in detail the numerous localities which have for many years been known to be capable of producing specimens of gold, and which in 1853–4 became the subject of most unreliable statements, and of stock-jobbing rather than mining operations. For many reasons this was regretable, and amongst others, because the question was left unsolved how far the interrupted occurrence of auriferous portions of veins might be profitable to work. No attempt at steady mining, or reasonable ore-dressing, was in most cases made. There were three mines only, the technical proceedings at which deserved any approval, whilst at many of them utter ignorance of the practice of mining and ore-dressing betrayed itself even in the apparatus placed on the surface.

The Clogau Mining Company (383) exhibit the remarkable results of the mere driving of a level or gallery steadily forward for a few fathoms in length, which in their St. David's lode has formed the first profitable gold mine worked in Great Britain. The vein, varying on the average from two to seven feet in width, and composed partly of quartz and partly of calc spar, contains disseminated spots of copper and iron pyrites, and the gold in minute particles often visible in large quantity. But the gold-bearing portions of the vein are interrupted by veinstone scarcely different in appearance, but either poor in gold or entirely without it. It is still, therefore, left for fair mining research to determine the problem to what depth the auriferous ground will hold, and what proportion of it may be expected in a given length of excavation.

Silver.—The ores of silver are so commonly associated in the same veins with other minerals, and the metal is so often extracted from ores of lead, with which it is intimately and invisibly intermingled, that it is sometimes difficult to draw a line of distinction between the two. There are, nevertheless, many instances in which, although the two metals may occur together, the silver is so much the more important product as to deserve the chief share of attention. For some years past the production of silver, generally, has not greatly increased; at all events, not conformably with the new discoveries of gold; but the indications of silver produce which we gather from the exhibition, are but meager and fragmentary.

California.—A remarkable group of rich silver ores from the new territory of Nevada was exhibited by Mr. Mosheimer, the specimens having been collected by Mr. Claudet. They consist of granular masses of mixed argentite, stephanite, and other silver minerals; and if half that is said of the thickness and extent of the veins can be accepted, the "territory" is destined to play an important part in enabling the production of silver to maintain its place against that of gold.

Lead.—No very remarkable novelties in the mining or metallurgy of lead have been introduced since 1851. Certain productive mines have been impoverished, or even closed, but others have sprung up to take their

places, and particular districts have no doubt been much affected by the change.

Copper.—In the production of this important and valuable metal many changes are taking place, the issue of which it is not easy to divine. Foremost among them are the gradual exhaustion of many of the mines of the Old World, and the marvelous exuberance of native copper in the region of Lake Superior, and of its richest ores in South America. Our British colonies are also straining every nerve to develop the remarkable deposits which have in so many of them been discovered, and even Central Africa is ransacked by European miners. The exhibition has supplied some isolated but yet interesting subjects for consideration.

Tin.—Standing as does Great Britain far at the head of the producers of tin, having raised in 1860, 10,462 tons of dressed ore (*black tin*), or 6695 tons of metal, there is nevertheless no particular feature of novelty since 1851 to refer to, unless it be the appearance in large quantity of tin in deep mines where for a time copper alone had been expected.

Nickel and Cobalt.—No particular advance has been made during the last decennium in the treatment of substances containing these metals, although in some instances a better quality of product is stated to have been attained.

Mercury.—Although we have again nothing especially new to notice, the ores of mercury have never before been brought together in rich mass from so great a variety of localities. France exhibits cinnabar from several places in the province of Constantine; Austria from Idria and Upper Hungary; the Zollverein from the Ludwig mine near Wetzlar; Italy exhibits, through Signor Curioni, the cinnabar of the Val Sassina, through Hahner and Co., that of Ripa (*Lucca*), and through Sadun and Co., the ores of the mine del Siele, near *Grosetto;* this latter being the only one still at work, notwithstanding that several of them were a few years ago held to be very promising. The mine del Siele is opened in several small veins which course through limestone of the eocene period, and yields about 7000 lbs. a year.

But the grand display for the ore of quicksilver is that of the giant specimens of solid cinnabar forwarded from the Royal Spanish mines of Almaden, where the lode sometimes attains a thickness of eight or ten yards, and where no diminution of richness appears to threaten the duration of the workings.

Platinum and other rare Metals.—In the production of some of the rare metals and their compounds, a great step in advance has been made within the last few years. No doubt it is partly to be ascribed to the general progress of chemical investigation and the researches of numerous chemists in a particular line of inquiry at the same time; but it is especially to the acuteness and perseverance of M. H. Ste. Claire Deville that we owe some of the great results which are brought strikingly to view in several departments of the exhibition.

Aluminium.—At the exhibition of 1855 in Paris, all the world wondered at the lightness and other characters of the aluminium, so successfully brought into a tangible metallic form by M. Ste. Claire Deville; but when the price was mentioned, it appeared very unlikely that the metal would come into general use.

Messrs. Bell Brothers of Newcastle have, by arrangement with M. Deville, taken the matter in hand on a large scale, and are now prepared to produce the metal commercially. They have for a couple of years been occupied in experimenting on it, and endeavoring to get it adapted to sundry purposes; and the beautiful case which they have erected in the exhibition contains a large group of objects which show the applicability of the metal to ornamental as well as to more serious ends. Additional value as well as beauty is bestowed on the display by the intermixture of the gold-like color of the aluminium-bronze formed by the alloying of copper with from five to ten per cent. of aluminium. Cellini helmets, candlesticks, ornamental inkstands, sextants, field-glasses, and a crowd of other objects in which lightness is an advantage, make up a great part of the attractions of the case; the aluminium bronze is also shown fitted for the bearings or plumber blocks of machinery, for which it is said to be far superior to brass.

The Messrs. Bell have exhibited samples of the curious newly discovered mineral from which the aluminium is now being made. It has been called bauxite, from the name of the commune in the south of France where it was first observed. M. Deville considers it to be essentially a compound of alumina, oxide of iron, and water; silica being present only accidentally, and generally in small quantity. He finds also one to two per cent. of titanium, and some vanadium. The variation in composition is great, for some examples give near eighty per cent. of alumina, and others up to forty-five per cent. of metallic iron.

M. Meissonier, who has examined the run of deposits of this mineral from near Tarascon, almost to Antibes, a distance of 150 kilomètres, finds that they extend in some instances to many yards in thickness, and believes that they occur as dykes traversing the cretaceous strata. The mineral is so applicable to many useful purposes, as to be well worthy of further study.

Class III.—Substances used as Food.

In a section of this importance, which brings under the experienced criticism of nearly every nation in the world those articles which constitute the food of man and the domesticated animals, it is not unnatural that we should expect to find the choicest contributions from every country to be laid before us. Purity and fineness of sample do not here form the only standards of excellence, but other considerations must be allowed their due weight in determining the merits of products raised in countries differing widely in climate and natural capabilities. Gratifying as it is to observe the interest and zeal with which perfection is sought in all the works of science and art, we cannot but inquire somewhat anxiously whether agriculture, that most important fundamental branch of industry, keeps pace with the universal progress in other directions; and it is, therefore, with no small satisfaction that we are able to recognize the truth of the remark made by the illustrious originator of this and the last exhibition, that "Agriculture, which was once the main pursuit of this as of every other nation, holds, even now, notwithstanding the development of commerce and manufactures, a fundamental position in the realm."

The following articles have been placed under the inspection of this jury, viz:

1. Common European cereals.
2. Cereals of comparatively rare cultivation in Europe.
3. Millet and other small grains.
4. Pulse (the pea and bean family).
5. Grasses and other forage plants, agricultural and horticultural seeds and roots, forest tree seeds, and models of fruit.
6. Flour, and preparations from cereal grains and other seeds.
7. Oil seeds and their cakes.
8. Hops.

To facilitate the adjudication of them they have been classed in three divisions: the first embracing Nos. 1, 2 and 3; the second, Nos. 4 and 5; the third, Nos. 6, 7 and 8.

I.—Common European Cereals.

Samples of wheat far exceed those exhibited in 1851, nearly every country contributing. Best specimens from the Australian Colonies, France, Great Britain, Spain, Italy, Greece, Algeria, some samples weighing 68 pounds per bushel. Spelt, or adhesive chaff wheat, from Germany.

Barley.—Germany, Denmark, Great Britain, Victoria and Tasmania. Best sample from Prussia, weighing upwards 69 pounds per bushel. Four and six-rowed barley from northern Europe. Naked barley, Spain, Portugal, Hungary, Greece, Canada and Brazil.

Rye.—From Europe mainly; their division into summer and winter rye is recognized, and the superior quality of several of the Prussian, Austrian and Hungarian samples implies an increased attention to its cultivation and improvement.

Oats (*Avena*).—The common variety (*A. sativa*) are exhibited in much greater perfection by the British colonies than by the United Kingdom itself. Scotland, the favorite country of this grain, has never yet produced samples equal to those sent by Tasmania and Victoria, and credit is due to Tasmania for the heaviest sample in the exhibition, viz., 51 lbs. 10 oz., per bushel, although on account of their wonderful freshness, the samples from Victoria, weighing 49 lbs. 4 oz. per bushel, named "White Tartarian," might be considered as fine. Excellent samples of black Tartarian oats, a variety of *Avena Orientalis*, appear in most of the European collections, as well as in those of Canada, Nova Scotia, and the other North American colonies. The naked oats (*Avena nuda*) appear in several collections from northern Europe; but the short oat (*A. brevis*), and the bristle-pointed oat (*A. strigosa*) are confined to scientific collections. In the British collection the jurors find by the side of a very fine sample of oats, weighing 50 pounds per bushel, a sample of barley marked, "grown from oats," and are surprised how such a delusion could gain any credit at the present day.

Indian corn (*Zea mays*), or maize, of little practical interest to the farmer of the United Kingdom, is exhibited largely by countries favored with greater heat and sufficient moisture; possessing in such climes a range as wide as any other cereal, and constituting a chief source of food for man and the domesticated animals. Besides innumerable samples from Spain,

Portugal, Italy, France, our own colonies in Australia and North America, a very fine collection, containing 200 varieties, is contributed by the Botanical Society of Modena. The State of Ohio also sends some fine samples, and several very good specimens are in the collection from Algeria. A peculiar large white-seeded kind, both in ear and grain, is sent by Peru.

Buckwheat (*Polygonum fagopyrum*) is exhibited in most of the collections from Europe and the North American colonies, generally of excellent quality. The silver-seeded variety appears in some of the French collections; the *P. tataricum* in some of the collections from southern Europe, and small samples of other kinds appear in several scientific collections.

II.—Cereals of comparatively rare cultivation in Europe.

Rice (*Oryza sativa*), the most important cereal in tropical climates, is shown both in its clean and husked or paddy state. In Europe the southern countries alone exhibit it, (Spain, Portugal, Italy, Greece and Turkey,) but it forms an interesting and prominent feature in the collections from Brazil, Ceylon and the East Indies, in which last a great many named varieties are distinguished.

Broom corn (*Sorghum vulgare*), and Guinea corn (*S. bicolor*), sometimes known under the name of Indian millet, are exhibited in the Italian, Spanish, Portuguese and French collections, in several varieties; and it appears also from Africa, where it is extensively used as bread corn.

Sorghum saccharatum, or Chinese sugar-cane, appears fully equal to several other kinds in sample of grain, and is the subject of wide experimental culture for its saccharine principle as well as for cattle fodder.

III.—Millet and other small Grains.

As millet ripens so late here, we could not expect to see samples in the British collection; but from Germany and south Europe, where it is such a favorite article for human food, all the varieties, both of the *Panicum milliaceum*, or loose-headed millet, cultivated generally northwards, and *Setaria Germanica* and *Italica*, close-headed millets of a southern range, are well exhibited. Dr. F. Welwitsch has sent specimens of two gigantic close-headed kinds from the Portuguese colonies in Africa. The Polish millet (*Glyceria fluitans*) is confined to a few of the grass-seed collections; and the Portuguese collection contains some excellent samples of the African millet (*Eleusine ceracana*).

IV.—Pulse (*the pea and bean family*).

Nearly every European collection, and particularly those of Sweden, Germany and Russia, exhibit samples of peas and beans, chiefly the common pea (*Pisum sativum*) and the common bean (*Faba vulgaris*). Canada and Britain show the best samples of the small horse-bean; and of the kind known under the name of Mazagan, a very fine sample appears from Sweden. Windsor beans, the large, broad, garden variety, are shown in excellent quality by Canada; while Spain and Portugal exhibit numerous specimens of the medium-sized varieties.

Kidney beans (*Phaseolus vulgaris* and *Phaseolus multiflorus*) appear in great numbers from France, Prussia, Italy, Spain and Portugal, forming, in

the last country, the leading feature of its agricultural products, some collections having upwards of thirty varieties. Among many samples of the kidney beans, that cannot be surpassed, is a pure black variety from British Honduras.

V.—Grasses and Forage Plants.

Grasses are shown in the British, French and German collections. Fine samples of timothy, grass-seed (*Phleum pratenze*), Germany and North American colonies. Rye grass, Denmark, Italy, Portugal and France. Clover family, France, Netherlands, Sweden. Scarlet clover, principally from France, and sanfoin from Germany.

Models of fruit from Horticultural Society, Paris, Victoria, British Guinea, Jamaica; and preserved fruits from Nova Scotia.

VI.—Flour and Preparations from Cereal Grains and other Seeds.

The above-mentioned agricultural products are only to a very small extent directly available for human food by the simple processes of baking, cooking or roasting. Those that are of the greatest importance belong to the cereals; they are enveloped in a siliceous coat, not easily digestible, that must be taken off or torn into minute particles before the grain can give an agreeable and nutritious food.

Those countries that have not attained a very high position amongst civilized nations, prepare the grains for immediate use by grinding them between stones or in a rude kind of hand-mill. With the more civilized nations, the preparation of grains forms the important business of the miller.

Of the inhabitants of the globe, the greatest number live on rice, it being the staple food of the densely populated parts of the Indies, China, Japan, the Indian Archipelago, Persia and Turkey; and it forms no inconsiderable element in the food of nations of German and Roman origin. Thus, in England alone, there is an annual import of rice from 150,000 to 200,000 tons.

The raw rice grain, or paddy, is decorticated by mills, and is so directly rendered fit for cooking and consumption. The production of rice flour is of no great importance.

Rice excellently husked is exhibited by most of the southern countries, but there is no distinct exhibition of produce from different husking mills.

Millet in its various kinds is treated similarly to rice in the husking. It is of vast importance in Africa, where it forms a chief article of food. Sorghum (Durrha of the Arabs, Dari of the Greeks) is the favorite food of the negroes, who also brew from it a kind of beer called Algoa; it is not exhibited husked. The southern and eastern parts of Europe grow instead of sorghum, which they only use as cattle food, varieties of panicum and setaria. Millet, husked, is shown only by Russia and Hungary, and of very fine quality.

After husking, comes the process used in the milling of pearl barley (Graupen of the Germans), called so from its being husked and broken, and then formed into small globules, which are separated by sieves of different sizes.

Germany and Denmark chiefly excel in the production of pearl barley.

We next come to those mill products, crushed into fragments, such as groats (Grütz of the Germans), for which purpose buckwheat (*Polygonum Fagopyrum* and *tataricum*) and oats are used. Fine buckwheat groats are exhibited by Germany, Denmark, and principally by Russia; oat-groats by Germany, Denmark, France, and in very fine quality by some of the British colonies.

Flour for bread-baking and pastry, with or without fermentation; this requires more than husking and crushing, namely, grinding to a powder so fine as to contain in the greatest quantity the starchy matter, after separating as drily and finely as possible the siliceous matters contained in the outer skin or bran. Good flour must therefore be white, dry, without particles of bran, and yet containing as much of the gluten or flesh-forming matter as possible, which accumulates chiefly in that part of the grain nearest the skin.

Starting with the lowest quality of flour, in which we have that made from a variety of articles, such as chestnuts, French beans, peas, lentils, all producing a coarse kind, we find the first really good flour in that of maize, chiefly eaten in the form of a gruel made from the flour or the semolina (Grier of the Germans); it is also baked as a fermented but very dry bread, like that exhibited in the Italian collection.

The finest and most interesting flour made from this grain is that manufactured and exhibited by a M. Bezet, a Frenchman, in the Algerian collection, who, according to his own statement, so dexterously removes that part of the grain around the embryo containing the most of the fatty matter, as to obtain a flour capable of great fermentation.

Of still greater value is rye flour, which is used in northern and eastern Europe, and almost entirely for bread, and is frequently mixed with wheaten flour. Exhibited by the Zollverein, Austria, Denmark and the Netherlands.

Wheat Flour.—The collection is very rich—great progress has been made since 1851. English millers exhibited well, though not largely. Flour made by the German or Gruaux process, is a complete success in Great Britain. British colonies have very fine flour; France, the flour is very fine; Austria, which has always held a high position, has carried the day in flour. The United States has two exhibitors, who well represent the extensive milling trade of the country.

VII.—Oil Seed and their Cakes.

These are extensively exhibited in the Continental collections, and North American colonies.

VIII.—Hops.

This important product, which received little attention in the exhibition of 1851, is represented on the present occasion by samples from every hop-producing district of England, from two British Colonies, from twelve European countries, and from the Northern States of America.

In regard to delicacy of flavor, brightness of color, and perfection of curing, English hops maintain their well-merited high reputation.

In strength or amount of lupuline, the hops from Bavaria and Bohemia can hardly be surpassed, while for the most part their curing is excellent.

The samples from other German States (often represented as Bavarian) are generally of fair moderate strength and flavor, but too often badly cured, and picked with too many green leaves.

France exhibits hops from Alsace and Lorraine, of excellent flavor, but somewhat deficient in strength. They are carefully picked, and in some cases very well cured.

From Belgium most of the samples exhibit the usual fault of hops from that kingdom, being badly picked, with too much stalk and green leaves, and with a smell of smoke, from bad curing. A very marked exception may be noticed in the admirable sample, No. 74 in the catalogue. Were all Belgian hops managed with similar skill, their value would be greatly enhanced in the London market.

The hops from Canada and the States still exhibit the disagreeable flavor which renders them quite unsuitable for fine qualities of ales.

Hops are also shown from the Netherlands, Denmark and Greece, but of very inferior quality.

Portugal exhibits samples of wild hops, which seem to indicate the possibility of successful cultivation.

Collections.—Vilmorin, Andrieux & Co., Paris, finest scientifically arranged and instructive collection. Samples of nearly every raw produce referred to in the whole exhibition may here be found. The specimens in straw of almost all the wheats cultivated in Europe and United States, named by the late M. Louis Vilmorin, the first authority for the nomenclature and identity of the numerous varieties of this cereal.

CANADA, as might be expected, exhibits largely in this section; and although generally the samples are good, yet the exhibition of cereals, as a whole, is not equal to that of 1851. Of course allowance must be made in the comparison between 1851 and 1862 for the hurried manner in which the collection for this exhibition has been made amid the excitement of the American war. The collection consists chiefly of grain, seeds (including several very fine samples of flax seed and timothy-grass seed), flour, and one specimen of hops. Out of forty exhibitors, showing 127 lots, fifteen medals and twenty commendations have been awarded.

TASMANIA.—Among thirty exhibitors, chiefly of cereals and flour, there is one fine sample of oats, weighing 51 pounds ten ounces per bushel, the heaviest in the exhibition. There are also some fine samples of wheat. Six medals and seven commendations have been awarded among the exhibitors.

TRINIDAD sends, through its exhibition committee, rice in the husk and cleaned, ground nuts, sesamum, "akee" seeds, Brazil nuts, ornamented seeds, "timite" fruit and seeds, vegetable ivory, "grugru" nuts, &c., and has received two medals.

VANCOUVER.—A medal has been awarded for a collection of seeds and cereals, in which there are oats weighing 46 pounds and wheat 64 pounds per bushel; very fine timothy-grass seeds, garden seeds, potatoes of field growth, and seeds of the gigantic arbor-vitæ, called white cypress. The collection is sent by the executive committee.

VICTORIA shows the most select collection in the exhibition of the ordinarily cultivated grains. There are fifty-two exhibitors, chiefly of wheat,

but also of barley, oats and flour. The heaviest wheat weighs 68½ pounds per bushel, and the larger proportion from 66 pounds to 68 pounds per bushel; it is not only in the weight, however, but the general perfection of the grain that is so commendable. The oats are also very fine, weighing 49 pounds 4 ounces; and although we may in this country surpass the quality of the barley exhibited, we do not often equal the weight, viz: 58 pounds 5 ounces per bushel. Two barrels of oatmeal are very fine; and altogether this exhibition has impressed the minds of the jurors with the great agricultural capabilities of the colony. The Victorian Exhibition Commissioners show a large collection of colored plaster casts, illustrative of the fruits and vegetables of the colony, consisting of apples, pears, cherries, plums, strawberries, figs, oranges, melons, and an assortment of vegetables, for which a medal has been awarded.

DENMARK has a good display, chiefly of grains and flour, shown by thirteen exhibitors. The cakes of compressed bran are considered by the jury to be worthy of the notice of corn-mill owners. The Agricultural Society of Kiel contributes an interesting and instructive collection of produce, and the mill products generally are excellent: in all, three medals and five commendations have been awarded.

FRANCE has a very extensive display, every department having sent a collective exhibition, and nearly all the agricultural institutions of the country are included as exhibitors. The number of collections is 120, but there are more than 500 individual exhibitors.

Besides many interesting collections of cereals in straw, there are extensive collections of cereals, pulse, and other seeds in grain; flour and other mill products being also well and extensively exhibited—special attention being directed to the wheats. The most interesting and instructive collection of almonds in the exhibition has been sent from Montauroy. A few specimens of hops appear good in quality, but capable of improvement in curing.

The jury have remarked with special satisfaction the collection of wheats and mill products of M. Darblay, showing his continued attention to this important branch of French commerce. The Imperial Society of Horticulture contribute a very superior collection of models of fruits grown in France.

Forty-seven exhibitors have been selected as worthy of medals, and thirty-six of commendations.

The whole exhibition from France is decidedly an improvement on 1851, and generally most creditable.

RUSSIA has sent a very excellent collection of all the cereals, of which the millet and rye are exceedingly fine; pulse, such as lentils, peas and kidney beans, and seeds generally cultivated in the empire. There are some very fine samples of oil seeds, especially linseed, hemp seed, rape, ricinus, and sesamum, and the excellence of the sunflower seeds particularly merits the praise of the jury. There are also fine samples of madder seeds, safflower seeds and coniferous seeds; rye meal, pease meal, buckwheat, flour and groats are also well represented.

One of the most instructive collections in the exhibition is sent by the Agricultural Department of St. Petersburg, previously referred to.

United States send flour from two individuals; one lot of maize in ear, and maizena, or Indian corn flour, samples of cereals, clover and timothy. Two medals and two commendations have been awarded.

Spain has about 300 exhibitors, showing upwards of 2,000 objects, among which may be specially mentioned wheat, maize, rice, broom corn, millet, barley, rye, oats, chick peas and common peas, kidney beans and common beans, lupins, lentils, and different sorts of vetches, the roots of *Cyperus esculentus;* carob bean of various qualities, fennel, cumin, anise and coriander seeds; almonds, chestnuts, hazel nuts, sweet acorns, and several other sorts, and many samples of flour. Twenty medals and forty-five commendations have been awarded.

Sweden.—There is a very interesting exhibition from this kingdom, almost altogether of cereals, pulse and seeds; and the fine quality of the peas and tares and timothy grass seed at once attracted the notice of the jury. The clover seeds (No. 157) are worthy of notice, the alsike on account of its very fine quality, and a peculiar yellow-seeded variety of red clover (*Trifolium pratense*). The alsike is, without exception, the finest in the exhibition.

Turkey sends about 250 specimens from forty-seven exhibitors; they are interesting as being the foundation of good samples, but exhibit proofs of inferior cultivation and bad dressing. The complaint made in 1851 was, that justice was not done to the cereals, owing to the deficiency of dressing for the market: there seems but little improvement in this now, as seeds of weeds and wheat are exhibited in the same sample bottles.

There are, however, some good collections from the Governors of Philippoli, Drama, and Salonica, also from Mehemed Reshid, *Aleppo* and others, for which six medals and fourteen commendations have been awarded.

Egypt has a medal awarded for a collection sent by the commission, consisting of wheat, barley, rice, Indian corn, sorghum, flax, carthamus, sesamum, fenugreek, tobacco seed, lentils, beans, cotton seed, coriander, lupins, nigella, and Alexandrian clover, of which the samples are neither of very superior quality nor remarkably well cleaned.

In connection with this class, there was on exhibition preparations of food, as sold for consumption, in great variety—dried fruit, teas and substitute for tea.

Sugars.—The production of sugar has been more largely illustrated in 1862 than it was in 1851; but there has been little marked improvement in its manufacture during the eleven years which have elapsed since the former exhibition; notwithstanding that the use of the turbine or centrifugal process, whereby the molasses is more quickly separated from the crystallizable sugar, has been much extended.

Beetroot sugar.—When Napoleon I. introduced the so-called continental system, excluding from the European markets all colonial produce, he at the same time promised high premiums for the discovery of a substitute for colonial sugar. The consequence was that sugar extracted from the beetroot obtained a place in industry and commerce; but this new branch of manufacture had naturally to deal with great and numerous difficulties before it was established on the firm basis on which it now rests. The struggle was for more than half a century, and it was directed towards

the improvement of the chemical processes as well as the mechanical appliances.

In fact it is only about thirty years since the produce of these factories has commanded attention in commerce. During this time numerous manufactories have been established in Europe, especially in France, Belgium, Austria, Prussia, and Russia. So considerable, indeed, is the amount of produce in these countries, that in Austria and Prussia very nearly the whole of the want of the population is supplied by the inland produce; while France, Belgium and Russia supply a very large proportion of the demand by their own factories. The demand for sugar in Austria has increased considerably during the last few years; it amounts now to nearly five pounds per head per annum, and the proportion is still farther increasing.

The establishment of so many factories has produced quite a revolution in agricultural pursuits, and has transformed field labor into a species of gardening; at the same time it has exercised a very beneficial influence upon the fattening of cattle—the residues of the factories constituting an excellent food for sheep and oxen.

The great difficulties formerly experienced in the manufacture, arising from the complex nature of the beetroot juice, have been overcome by chemical and physical appliances.

The proceeding most commonly adopted for the manufacturing of beetroot sugar is this: Crushing the root and pressing out the juice; defecation by the aid of lime; filtration through animal charcoal; concentration of the juice in the vacuum; a second filtration through animal charcoal; and finally the boiling of the syrup to the point of crystallization.

Further improvements, both in machinery and chemical processes, are to be anticipated from the energy of those who are engaged in this manufacture.

Several new processes are illustrated at this exhibition, namely: Pessier's method for precipitating the mucus by mixing three parts of alcohol with the syrup of the beetroot, and for recovering the spirit by distillation, after which the syrup, thus cleared of foreign matters, is boiled and converted into sugar.

Another method is Leplay-Cuisinier's, consisting of a process for revivifying animal charcoal without igniting.

Finally, there is Rousseau's process, which consists in the defecation of the crude syrup by means of several treatments with lime, and afterwards the precipitating the lime by carbonic acid.

Cheese.—From the earliest records in agriculture, we can fairly suppose that cheese was used by man as an alimentary substance before the time of the patriarchs. Wherever there are cows, sheep, goats, or other animals yielding milk in abundance, there also cheese is made of a more or less refined quality. For millions of people it constitutes a wholesome and substantial food, being rich in the plastic or nitrogenous elements of diet; while the finer varieties of cheese are a delicacy in the saloons of the wealthy. The perfumed herbs of the slopes and valleys of the Alps communicate a high flavor to the celebrated cheese of Switzerland, and the rich verdure of the plains of France, Italy and England furnish immense

quantities of both mild and strong cheese, which commerce distributes to all countries.

The display of cheese at the present exhibition, although pretty large, is not proportionate to the produce of the countries, taken separately.

SWITZERLAND, for instance, one of the most celebrated producers of cheese, is represented only by one exhibitor, showing specimens of the most excellent Emmenthal and Gruyère; the first of these cheeses being inclosed hermetically in tin boxes, in consideration of the strong perfume which it would spread all around.

FRANCE exhibits a very rich and numerous variety of cheeses, some of them inclosed in glass, with an ingeniously contrived cover, fastening by means of a screw, which preserves the freshness of the article without concealing it from inspection. The milk produce in general is treated in France in a very rational manner, and therefore none of the countries of Europe possess such a variety of fine cheese as France, the soft and fat cheese deserving especial distinction. Besides the happy imitation of Swiss and Dutch cheese, the principal kinds of French cheese exhibited are those of Brie, Livorat, Camembert, Mont d'Or, Gournay, Roquefort, Moral.

ITALY has maintained her ancient repute with her Parmesan cheese, which is hard, strong and aromatic. It is mostly employed after being ground. Most of the Italian cheese are goats' and sheep's cheese, of a dry description.

PORTUGAL has made a display of a great quantity of fine and excellent cheese, part of it preserved in oil and inclosed in tin boxes. These cheeses are rather small, flat and round, resembling the Parmesan. Besides supplying the inland consumption, there is a large export of it to Brazil.

As for GERMANY, there is among the exhibited samples some Lüneburg cheese from Mecklenburg, which deserves special mention for its excellent qualities.

The NETHERLANDS have also some excellent cheese in the building. It is of a large size, like the Gruyère; its flavor resembles the cheese of Cheshire.

DENMARK has brought to the exhibition several excellent imitations of Swiss cheese, which, in fact, rank with the best kind of cheese exhibited in the building.

NORWAY has excited our surprise by showing samples of goats' cheese, of a yellowish-brown color, and of a cubic form, fat, and of excellent flavor.

The same cheese, although of a somewhat milder flavor ,is also exhibited from SWEDEN. It is formed into a cylindrical shape; and, besides this, there are some very good cheese in imitation of Gruyère.

Generally speaking, the display of cheese is very satisfactory, showing not only a great advancement in the art of manufacturing it, but also great extension in the matter of commerce—circumstances which tend to increase the wealth of many tracts of country, and to secure a nutritious food for the populations which are living thereon.

The only thing to be regretted is, that no information has been supplied as to the process and extent of manufacture of the different kinds of cheese in the several countries, nor about the amount of either inland consumption or export.

Class IV.—Section B. Perfumery.

Perfumery is the art of collecting all the various fragrant substances diffused throughout nature, of rendering permanent those which are volatile by fixing them into some solid bodies, and of presenting the whole in an available and convenient shape for the purposes of the toilet, or for the gratification of the olfactory organs.

Perfumes have been used from the earliest times by all nations having any claim to civilization and refinement. The first known were gums and resins, such as myrrh, styrax and incense, which emitted a fragrant smell by burning, a circumstance to which is to be traced the origin of the word *perfume* (per fumum.)

The ancient Egyptians applied perfumes to three distinct purposes: offerings to the gods, embalming the dead, and uses in private life. As regards the first, it seems to have been a natural impulse among all primitive nations to offer incense to their deities. Oblations of all kinds were deemed meritorious, but that of sweet aromas appeared to them the most appropriate. They seemed to see in the blue wreaths of smoke ascending towards the ethereal realms a sort of symbol of the prayers and wishes they addressed to their inhabitants. In the temples of Isis and Osiris fragrant woods and resins were constantly burning; and at Heliopolis, the City of the Sun, where that god was adored under the name of Re, the priests offered incense to him three times a day, resin at his rising, myrrh when in the meridian, and a mixture of sixteen ingredients, called kuphi, at his setting. The sacred bull Apis had also his share of such homage, and those who came to consult him burnt incense on his altar and filled his lamps with perfumed oils. In grand ceremonies the king himself officiated, holding a censer in one hand, and throwing pastilles into it with the other, as we find it represented in some of the sculptures. Besides incense, sweet ointment was sometimes offered to the gods and rubbed over their statues by the high priest.

The custom of embalming the dead also gave rise to a great consumption of aromatics in Egypt. This practice probably arose from two principal causes: one was the respect they had for their deceased friends, whose remains they preserved in their houses, paying them a sort of worship; the other was their belief that the soul of man returned into the body after a migration of 3,000 years, during which it passed successively through the bodies of all sorts of animals. There were three different classes of embalming: the first, which was very costly, was done with myrrh, cassia, and other fragrant substances; the second with oil of cedar; and the third, which was confined to the poorer classes, simply with syrmœa and salt.

Perfumes were much used by the Egyptians in private life. They made a great variety of ointments for the hair and body, some flavored with native plants, others with drugs procured from Arabia. An alabaster bottle preserved in Alnwick Castle contains one of those preparations, which has retained its scent after a lapse of 3,000 or 4,000 years. Egyptian ladies also used a cosmetic called kohl, made from antimony, to darken the eyelids and make the eye appear larger and more brilliant—a practice still maintained throughout the East.

The Jews, Greeks, Romans, and the French, all engaged in the manu-

facture of perfumery. In England, perfumes were at first imported from Italy and France, and came into great vogue during the reign of Queen Elizabeth. Shakspeare often mentions musk, civet, perfumed gloves, and pomanders, or pommes d'ambre, which were balls of perfume, to be held in the hand and smelt occasionally. The latter were supposed to preserve from the plague.

It is difficult to ascertain the precise date when manufactories of perfumery were first established in England, as perfumers did not form here a separate corporate body as they did in France; but an old English recipe book, printed in 1663, contains a dentrifice prepared by M. Ferene, of the New Exchange, perfumer to the Queen, so that they had already at that time begun to manufacture. Since that period the perfumery trade of England has followed about the same progress as that of France, until it has reached its present state of prosperity.

Perfumery is now divided into two distinct branches, the preparation of perfumery materials, and the manufacture of perfumes, cosmetics, and toilet soaps. The former is chiefly carried on in the south of France, Italy, Spain, Turkey, Algeria, India, and other warm countries, where the climate gives to flowers and plants the intensity of odor required for a profitable extraction. England has produced only, hitherto, lavender and peppermint, but which are both greatly superior in quality to any grown elsewhere.

United States.—In 1851 the United States sent nine exhibitors of perfumery, which number has dwindled down to two, in the present exhibition —a fact easily explained by the present disturbed state of that country. These two show essential oils of American production, comprising peppermint, spearmint, sassafras and wintergreen. The first is not equal in quality to English oil, but sells at about one-quarter of the price; the other three are largely used by perfumers for scenting common soaps.

Class V.—Railway Plant, including Locomotive Engines and Carriages.

Number Exhibitors of Engines.

Nation.	No. of exhibitors.	Awards of the jury. Medals.	Honorable mention.
United Kingdom	79	16	15
Canada	2	1	1
Belgium	11	3	4
France	43	6	7
Austria	8	3	1
Bavaria	1	..	1
Prussia	12	5	2
Saxony	1	1	..
Italy	6	1	2
Russia	1	..	1
Sweden	3	1	..
United States of America	2	..	..
Total	169	39	34

There is, undoubtedly, little of novelty to be remarked on in the construction of the greater proportion of the large number of locomotive

engines sent to the present exhibition, when compared with the locomotives running and exhibited in the year 1851.

It may, however, be obserbed that there is a general increase in the weights of locomotive engines. Two of those exhibited, constructed for the narrow gauge lines of railway, have a weight of upwards of fourteen tons on a single pair of wheels, and one of these, whose weight when full is 30 tons 13 cwt., has only a wheel base of 15⅔ feet.

The competition for traffic which exists between the various lines of railway in this country, has also led, in many cases, to an increase in the distances between the stopping stations for express and fast passenger trains. Nearly all the locomotive engines are constructed so as to burn coal instead of coke, in order to diminish expenses.

The greatest improvement which has been made in the permanent way of railway, has been from the general adoption of the practice of fishing the joints of the rails, when these are supported at intervals on transverse sleepers. The correctness of the principle is now generally admitted.

The London and Northwestern Railway Company exhibit a locomotive engine and tender, constructed for express passenger traffic; a model of an apparatus for supplying water to tenders whilst running on a journey, and a duplex safety-valve, constructed at their locomotive establishment at Crew, from designs by Mr. James Ramsbottom. The locomotive, "The Lady of the Lake," is a six-wheeled, coal-burning engine, with outside cylinders, 16 inches in diameter, 24 inches stroke, having the leading and trailing wheels of 3 feet 7½ inches in diameter, while the driving wheels are 7 feet 7½ inches in diameter. The distance between the centers of the leading and driving wheels being 7 feet 7 inches, and that between the driving and trailing wheels is 7 feet 10 inches; the total wheel base being 15 feet 5 inches. The center of gravity is in front of the driving wheels. The total weight of the engine when full is 26 tons 17 cwt., and the maximum weight on a pair of wheels is 11½ tons. The engine is fitted with two of Giffard's injectors, size No. 10. The tender carries 1,500 gallons of water and two tons of coal. The fire-box is constructed with two openings at the front for the supply of air. The heating surface in the fire-box is 85 square feet and 915 square feet in the 192 tubes, making up a total heating surface of 1,000 square feet.

The trough filled with water, into which the apparatus fixed on the tender is dipped for the supplying of water to the tank while the engine is running on its journey, has now been laid down fourteen months. Water commences to flow into the tank when the tube is lowered into the trough, when the engine is running at the rate of 22 miles an hour, the lowest rate at which it will do so; and during the time this trough has been laid down 1,366,000 gallons of water are stated to have been taken up by engines in this manner, and no difficulty has hitherto been experienced from the water in the trough freezing. The London and the Northwestern Railway Company are understood to be about to lay down troughs at some other stations.

Railway carriages and wagons did not possess any particular novelty.

Railway carriage wheels, axles and tires.—Great improvements in relation to wheels, axles and tires have taken place since 1851. Unwelded tires,

both of iron and steel, are in more general use on the continent than in Great Britain.

Railway Carriage Breaks.—Two medals were awarded for improvements in carriage breaks, and wide as may be the differences of opinion with reference to the practicability of applying a much larger proportion of break power to passenger trains, at a moderate cost, than they are now usually supplied with, there are few that will dispute the assertion that if it can be practically done, a much greater proportion should be allotted to trains that travel over portions of their route at rates exceeding fifty and sixty, and probably in some instances approach to seventy miles an hour, than to those which do not exceed half that rate. The divergence of opinion usually arises when the means of carrying out such a proposition are discussed. Locomotive superintendents generally contend, and with much reason, that as the driver of a train usually becomes aware of an obstruction on the line on which he is traveling, in front of his train, before any other person, he is the proper person to be supplied with the retarding force necessary to arrest the progress of his train before the obstruction is reached; but generally they fail to carry out their own theory to the extent which the vehicles exclusively under the control of the driver would readily admit of. Thus no breaks are usually applied to any but tank engines—the breaks at the control of the driver are limited to those put on by his fireman on the tender—and experience has proved that there are numerous instances on record where it would have been highly expedient, and have led to the saving of human lives, that the guard of a train should have had a large retarding force at his command at the tail of a train.

A medal for improvements awarded, by which breaks fitted on to several carriages in a train may be worked by one guard from a break-van placed at the ends or in the center of a train. These are commonly called continuous breaks. These act by means of a longitudinal shaft attached to the under side of the frame of the carriage or break-van, the shafts under the adjacent carriages being connected together by a notched coupling. The guard by the use of ordinary machinery turns these longitudinal shafts, on which endless screws are fixed, opposite and working into rack-work attached to the rocking or break shafts under each carriage; and thus, when the longitudinal shafts are turned, the break blocks are forced against the periphery of the wheels of the several vehicles so connected together, usually not more than three or four.

This continuous break is simple in its construction and powerful in its operation, when in thorough adjustment. It is a step in the right direction, but it is by no means a perfect continuous break, inasmuch as there are no self-adjusting means by which the pressure of all the break blocks on the wheels can be equalized.

The locomotive weighing machine is a great improvement on that exhibited in 1851. Independent rails or tables for each wheel, with a separate steelyard for each wheel, are introduced, and these steelyards are so arranged that there is no risk of mistaking the steelyard which corresponds with any wheel. When an engine is placed on the machine, the whole of the steelyards, though perfectly independent of each other, move in unison and simultaneously. An improvement is also effected in the mode of adjust-

ing the steelyard by means of a fine screw at the extremity of the longer arm, by which the proportions of the steelyard are changed, according to changes of condition affecting the balance. The poise or balance is combined of a main sliding weight, resting like a saddle upon the longer arm of the steelyard, which shows the tons, and of a cylinder revolving upon the main poise, exhibiting the hundred weights and pounds. No loose weights are required. A third improvement in the machine consists in its solidity, and the disposition of the knife-edged centers of the levers placed close to the extremities of the weighing tables, so that the "tipping" of the rails by the arrival or departure of an engine is prevented.

A machine for weighing and preparing "piles" for railway bars, entirely designed since 1851, is likely to be useful to iron masters. The frame in which the machinery is contained resembles the ordinary bench used by "pilers," but its top is like a miniature railway, part of which is a weighing table, and underneath are the proper levers working up to a steelyard, placed on the side of the frame, and so constructed that it can be set to the weight of "pile" desired to be made. The machine is furnished with small trucks, upon which in turn the "piles" are built; and when a sufficient amount of bars are piled to form a "bloom," the truck with its pile is pushed along the rail to the hand of the furnace man.

A weighing machine mounted on wheels and axles, designed since 1851, for the special use of rolling-mills and forges, is adapted for its work by unusual strength in all parts, and particularly by having the platform fitted with rollers to facilitate the loading and unloading of heavy rails and forgings. The steelyard and portable articles are locked within a penthouse which serves for their security, and to protect them from the weather.

Class VI.—Carriages not Connected with Rail or Tram Roads.

In submitting a brief statement connected with "carriages not connected with rail or tram roads," the jury report that they have examined with great care the objects exhibited in the class, British, colonial and foreign. Time does not permit at present to enter fully into the subject; it is, however, proposed at an early period to report more fully on the contributions that have been examined, and especially as to the changes that have taken place in such manufactures since the exhibition of 1851.

The carriages shown in the British gallery are on the average much lighter than formerly; in this department there is an entire absence of decorative court or even town carriages that would have increased the attractions of the display. From the experience of the 1851 exhibition, where several such carriages caused loss to the exhibitors, they have now abstained from sending such contributions.

Most of the English carriages show excellent workmanship and materials, some of them are also of elegant design, of well proportioned construction, and finished with good taste as regards choice of colors and decoration. There are, however, some marked exceptions, chiefly as to the choice of colors and decoration, which the jury cannot but refer to, as showing that there is room for improvement on this point.

The foreign contributors also show progress. France is the chief contributor from continental Europe.

Russia is the largest contributor of carriages, after France. Considering the difficulty of transporting bulky and delicate articles, such as carriages, they have arrived in very fair condition.

Prussia contributes a richly decorated State coach, made to the order of the present King.

Italy also sends a highly ornamented dress chariot.

From several other countries there are also contributions of carriages.

As might be naturally expected, the English contributions far outnumber the combined productions from all foreign countries, and those from London outnumber those from the provincial towns. London may indeed be said to be the chief seat of the carriage manufacture, both from the general excellence of the carriages built as from the extent of the trade. Among the provincial towns, Edinburgh, Dublin, Derby, Bristol, Liverpool, Manchester, Nottingham, Southampton, Glasgow and Newcastle-on-Tyne produce largely for the home and export trade. On the continent of Europe, Paris holds the highest place as regards the excellence and the extent of its carriage building trade, which of late years has much increased as well as improved in the style, workmanship and durability of its productions. The French export of carriages has also greatly increased of late years. A large trade is also carried on at Brussels, Hamburg, Vienna, Aix-la-Chapelle, Offenbach, Milan, Rome, the Hague, St. Petersburg and other cities and towns.

America, which only contributes two very light carriages, has rapidly risen to a great producing country for carriages; its productions are of a type quite original and peculiar to the country; and in some points have attained a singular excellence as regards lightness combined with comparative durability; their execution shows good ability on the part of the workmen. To Europeans these light carriages have a very singular appearance; they, however, probably meet the wants of the American public from their light draught. The bodies are small; the difficulty of getting into the carriage among or over the high wheels, is one requiring great activity to overcome, and the quantity of mud thrown by the very high wheels must be somewhat alarming.

There exists an Imperial manufactory for carriages at St. Petersburg, directed by an Englishman; it is well organized, and adapted for producing the private carriages used by the Russian court. The various processes are there carried on, even to the weaving of the lace and the production of the ornamental metal chasings; it has probably had a good effect in improving the carriage manufacture in Russia, the contributions from which country are not only numerous, but show points of careful consideration in the construction and design. The Russian nobility are fond of having their equipages well turned out, and import many carriages from England, France and Germany. The carriages in Russia, and those sent there, must necessarily be strongly built, as the thaw in spring, after the winter frosts, so breaks up the roads and paving, that a light or weak carriage must soon give way. Unlike these must be the carriages for the Australian markets, where, in consequence of the taste for light carriages

built on the American system, much of the trade has fallen into the hands of the coach-builders of the United States.

The tastes and requirements for private carriages have evidently of late years taken a great change. The English department does not contain a single carriage fitted with a hammercloth; such carriages are still used by the high aristocracy of England during the London season. There were two excellent examples of town chariots with hammercloths sent to the exhibition of 1851; and it is to be regretted that such carriages, which are capable of bringing out the best abilities of the constructors, are not to be seen in the department; perhaps for some future exhibitions, gentlemen of taste, wealth and rank may feel inclined to give orders for such carriages, that they may be temporarily placed in a collection that is certainly not complete without them.

Nor is there a traveling carriage. We may now, perhaps, feel assured that the railway has the entire monopoly of transporting travelers on long journeys throughout western Europe; there are still links missing in Spain, Italy, Sweden, Russia, and a few other States of Europe; but, as regards the manufacture of private traveling carriages in England, it is now evidently a thing of the past, probably soon to pass out of mind, or only to be remembered by the older masters and craftsmen.

Woods are shown in such great quantities and of such excellent quality by the English colonies, that a trade will probably be opened with the coach-builders of Europe.

The only new woods recently adapted by the English coach-builders are the Canadian black walnut and American hickory. The former grows to a great size, and is advantageously cut into panels, which are free from figured grain, and for many purposes are an excellent substitute for Honduras mahogany. It must, however, be recollected that it requires time and great care to introduce new woods into a manufacture like that of carriages; they must first be thoroughly seasoned; it must then be ascertained by experiment if they require any peculiarity of treatment, or care in working; then if they are adapted to the variations of our climate, and what effect a hot sun in summer, or a continuance of wet in winter has upon them. The black walnut has been adopted by many of the principal upholsterers and piano-forte manufacturers for their internal fittings. The hickory is a most valuable wood for the spokes of light wheels.

Of all people, the Americans seem to have been most successful in applying machinery for working wood. One of their most successful applications is the making of wheels by machinery. Not only have they an excellent supply of light and tough woods, but the skill they have acquired, especially in making light wheels for carriages, has produced for them a great reputation. A trade has now sprung up in the importation of these light wheels to England for broughams and other light carriages.

Many and very considerable changes have taken place in the manufacture of carriages since 1851, mainly in consequence of a smaller breed of horses being used, so that a demand has arisen for smaller and lighter carriages. In point of weight there is a remarkable difference in the carriages of this exhibition and that of 1851; it is probable that there is an average diminution of about one-fourth in the weight of all the carriages shown in

the British department. Added to this, manufacturers have endeavored to combine greater elegance of general design with reduction of weight; under this head several manufacturers have combined the attributes of comfort, lightness and elegance with great success.

A revival of an almost obsolete carriage, "the four-in-hand coach," has taken place within a few years. They are generally built on the model of the best mail and stage coaches of former times, but with a much higher degree of finish. It may appear very easy to the uninitiated to build such a carriage, merely on the lines of former days, but in fact they require such careful and accurate planning of the several parts, individually and combined, that only those who have given much attention to them, and have to a certain extent been tutored by gentlemen who drive them, have been successful in turning out carriages of the kind that in most points meet their requirements. One of these carriages is the trophy of the British coach-builders, and is now in a conspicuous position in the nave of the exhibition building. The revival of a taste for such carriages is worthy of remark, as the management of a "team" not only requires great bodily strength, good nerve, and a quick eye, but being an expensive amusement, is mostly confined to the aristocracy and persons of wealth, with whose habits it is principally associated, and indicates something of that vigor of body which generally distinguishes the British gentry.

As some guide to persons interested in introducing colonial woods for coach-building purposes, a few remarks on the particular qualities required for certain parts may save many mistakes and much inconvenience.

For panels, the wood should grow to a large size (say 18 to 36 inches diameter), be sound throughout, without figured grain, moderately hard, and capable of seasoning in thin boards without twisting and splitting.

For bodies and underwork, a tough, hard, fibrous wood, capable of resisting wet, and somewhat elastic, with a long grain (from 12 to 30 inches in diameter).

For spokes of wheels, a hard, sound, tough and elastic wood, of straight grain (from 8 to 12 inches in diameter).

For felloes, a hard, sound and tough wood, capable of resisting wet (from 8 to 16 inches in diameter).

For naves of wheels, a very sound, fibrous and tough wood (diameter 8 to 12 inches).

For bottoms and roofs, a light, sound, compact wood (diameter 16 to 36 inches).

For footboards, rockers, &c., boot sides, a sound, hard, smooth-grained wood (diameter 16 to 36 inches).

The woods should possess these qualities without being excessively heavy.

Although the application of machinery to the construction of private carriages has progressed, many reasons prevent its general application to private coach-building purposes; some of which are, the great variety of carriages built by each manufacturer, the desire on the part of the purchasers to have carriages made to dimensions of their own choice, and the variations of pattern, as fashion indicates the lines that are most favored by those who lead in such matters.

The following machines are those that have been found best to answer the purposes required:

Fans for blowing forges, and circular and upright saws—the latter arranged to saw out two felloes at one operation.

Wood-boring and morticing machines.

Machines for boxing wheels.

Wood-planing and shaping machines; the latter fitted with tools for rebating, grooving, moulding and tenoning.

Spoke-turning machines.

Iron-bending machines.

Shearing, punching and drilling, and screwing machines.

Paint mills.

Grindstones for springs and ironwork.

It may be added, that in eleven years the tool-makers have not been idle; improvements to facilitate hand labor have been made, not only by comparing side by side the productions of English makers, but with those of continental and American makers; an intelligent workman who is paid according to the amount of work he turns out, looks for such aids to his labor with a keenness sharpened considerably by self-interest, and adapts himself to the work he is required to produce with great ingenuity.

There are certain requisites for coach-building that would improve carriages in several points. For colors, durable blues, lakes, and yellows are required; as is also a colorless and durable varnish. Of what avail is it that scientific men invent such beautiful colors as mauve, magenta, and others, if they are at once to be toned down by several coats of brown varnish? Coach varnish has been much improved of late years; but until delicate and beautiful colors can be used without being tinted with a film of brown to preserve them, varnish-making cannot be said to have reached perfection.

And lastly comes into notice the little vehicle so well known to all, "the perambulator;" it is a somewhat recent innovation, probably even since the exhibition of 1851. From the immense number that have been made, and continue to be made, they have evidently filled a gap that had long waited to be suitably filled. Not only were the children's carriages of former times (made on four wheels, and to be drawn instead of pushed) hateful to most servants that had to draw them, but they were the cause of occasional ill-feeling between children's nurses and their employers. "The perambulator" fortunately was invented, and restored harmony; they not only are light and convenient little carriages, and if well made, durable, but (with ordinary precautions) almost indispensable to the parents, nurses and children of the rising generation.

Class VII.—Manufacturing Machines and Tools.

Section A.—Machinery employed in Spinning, Weaving, &c.

The report of the jury in this class has not been received. It was a very interesting class, and three of the United States exhibitors received medals in section A: the How Sewing Machine Co., Wheeler & Wilson, sewing machine, and A. Smith for his loom for weaving tufted carpets, and four honorable mentions for sewing machines, &c.

SECTION B.—MACHINES EMPLOYED IN THE MANUFACTURE OF WOOD AND METAL.

W. D. Richards received a medal for improved boot and shoe machinery, and five honorable mentions for various kinds of machinery, which are specially noticed in the list of awards.

CLASS VIII.—MACHINERY IN GENERAL.

I.—GENERAL EXPLANATIONS AND REMARKS.

This jury held in all thirty-three meetings, commencing on the 7th of May and terminating on the 20th of June, 1862.

In considering the practical operation of the articles submitted to them, the jury were careful to come to no conclusion except such as was founded either on their own experience and observation, or on the authentic records of the experience and observation of competent persons not specially interested in the articles. Consequently, in the event of an article not having honors awarded to it by the jury, it does not in every case follow that the jury considered that article as having been proved to be faulty; but only that they were not able to obtain, during the time of their proceedings, evidence of its practical efficiency of that kind which they considered as alone sufficient to justify the awarding of honors.

It may be stated that a large proportion of the honors awarded are granted for such reasons as "good workmanship," "good arrangement," "practical utility," "practical success," &c., and that in such cases, for the most part, it is unnecessary to give any special explanation in addition to the simple statement of the reason in the list of awards. Special explanation is chiefly required in cases where the article contains something new or unusual.

In conclusion, it may be stated that when the machinery of the present exhibition is compared with that of 1851, it is found to be marked less by originality of invention, or the introduction of new principles, than by improvement in details, workmanship and material; and that with respect to material in particular, the most striking improvements are those which consist in the greatly extended use of steel, and of iron approaching to steel in its properties.

With respect to the steam engines in the present exhibition, as compared with those of 1851, it may be observed that they show an increased employment of high pressure, great expansion, and super-heating an increased use of surface condensation (generally effected by means of a great number of small horizontal tubes), a tendency towards simplicity in the framing and main moving parts, a general abandonment of devices that are more curious than useful, and a higher perfection of workmanship and finish; all of which improvements combine to produce greater economy of fuel, power and repairs.

For producing variable expansion, the system most frequently employed is the ordinary link motion; and next in order as to frequency, the link motion with a separate expansion valve driven by a third eccentric.

In many cases also, and especially in the foreign engines, the variable expansion is produced by means of the compound slide, regulated in some cases by hand, and in others by the governor.

In the governor of Mr. Porter's engine, U. S., a similar result is obtained by using light balls and a high speed, with a heavy vertical load to balance the great centrifugal force. The figure and movement of the side-valve in this engine are of a peculiar kind, suited to open and close rapidly with a comparatively small travel.

The pumping engines of Mr. Steele (United States), and of Mr. Worthington (United States), are remarkable as being engines of rapid stroke without fly-wheels. In the former there is a single cylinder, whose side-valve is moved, when the piston is at its dead points, by an apparatus which is in fact equivalent to a small auxiliary steam cylinder. In the latter there are a pair of equal cylinders, working at half a stroke behind each other, the slide-valve of each cylinder being shifted by the piston of the other.

In M. Scheutz's rotary steam engine (Sweden), the advantages of simplicity and compactness, which the rotary engine is admitted to possess, are combined with the power of working expansively in a very perfect manner, while at the same time the disadvantages of engines of that class are to a great extent overcome; for the pressures at the shaft are balanced, the sliding vanes or pistons are relieved of pressure while they are passing the stops, and the steam-tight bearings, when worn, can all be tightened at one operation, in consequence of the conical form of the casing.

The traction-engines to which awards have been made by this jury are those exhibited by Bray's Traction Engine Company (United Kingdom), J. Taylor and Co. (United Kingdom), Tuxford & Sons (United Kingdom). It is well known that, although steam carriages for common roads are of old date, traction engines, or road locomotives, are of recent introduction. All the three engines above mentioned work well in practice.

Mr. Bray's is capable of acting as a portable steam engine, a steam crane, or a fire engine at will; the rim of each of its two driving wheels is furnished with blades or spades, which can be pushed out or drawn in, according to the steepness of the road and state of its surface, and the load to be drawn, so as to give just the required hold and no more. Messrs. Taylor's is marked by the merit of great simplicity. It has two driving wheels, six feet in diameter, without blades. Messrs. Tuxford's has a single roller instead of driving wheels; its engine is well protected against injury by dirt, and the engine driver and steersman are together.

Section III.—Marine Steam Engines.

The general remarks as to progress since 1851, which have been made in section II., as to land engines, are applicable to marine engines also. The improvements in workmanship are even more striking.

A very large number of the marine engines exhibited possess merit of a high order, as this jury have testified by their awards. They have also indicated briefly in the reasons given for the awards the particular kind of merit by which each engine is most distinguished.

Of the marine steam engines, by far the greater number are horizontal screw engines; the reason probably being that such is the arrangement best suited for ships of war, and that the engines of ships of war can more easily be spared for purposes of exhibition than those of merchant ships.

The valve gear and expansion gear of the marine engines are very various. For reversing, the link motion is used in almost every case: an exception is found in the engine of the Mediterranean Company (France), where the engine is reversed by a piece of wheelwork, which, when acted upon by hand, causes each eccentric to reverse its position on the shaft that carries it. In Humphrey's and Tennant's engines an improvement in the construction of the link has been carried out, by making it of a single bar embraced by a slider, instead of a pair of bars with a slider between them.

In some examples the link motion is used for expansive working; but in most the cut-off is effected by means of a separate expansion valve, the mechanism for working which presents a great variety of designs.

Amongst various peculiarities of arrangement may be noted that of the pair of horizontal screw engines of Messrs. Rennie, in which the cylinders are at opposite sides of the shaft; each cylinder is directly opposite the air pump of the other, and each cylinder exhausts directly into the condenser by its side, so that exhaust pipes bridging over the shaft are dispensed with.

The horizontal trunk marine screw engines of Messrs. Penn, being exhibited by a member of this jury, could not be made the subject of an award. They are accompanied by a model, already referred to, and by separate parts of engines, showing great perfection of material and workmanship.

Section IV.—Windmills.

The windmill of Wentworth & Jarvis (United States) is chiefly remarkable for its regulator, which consists of a pair of slightly diverging vanes forming a sort of tail behind the cap of the windmill, and so connected with the sails that when the vanes, by the increased impulse of the wind, are pressed closer together the sails are turned into a position that exposes less surface to the wind.

Hot-air Engines.—Two from the United States and one from Prussia. No advantage in point of economy over the steam engines is claimed for any of these, their proper use being, like that of the electro-magnetic engine and the gas engine, to furnish a convenient motive power for small machines where a steam engine cannot be employed. As the working of these engines within the exhibition building would have been inconsistent with the regulation which prohibits the lighting of fires in it, the jury, in order to satisfy themselves that the engines worked in a smooth, steady and manageable way, obtained from Her Majesty's Commissioners permission for the exhibitors to remove them for a time from the building and set them to work outside. The results were satisfactory in the case of the two American engines; but the Prussian engine was unfortunately prevented, by accidental circumstances, from being set to work until after the proceedings of the jury were closed, so that they could not make any award upon it. It was afterwards, however, set to work in the boiler yard, when it moved smoothly and steadily, and was easily started and stopped. Both the American engines take in at each stroke a fresh supply of air, which is afterwards discharged; Schwarzkopf's engine retains the same air permanently, and transfers it back and forward between the hot and cold end of a receiver alternately.

HEAVY CASTINGS OR FORGINGS IN THE ROUGH; CASTINGS OR FORGINGS, PLAIN, INTRICATE OR BEAUTIFUL, IN THE ROUGH.

As compared with articles under these heads exhibited in 1851, we consider there is a decided improvement; few, however, are exhibited in this class as abstract specimens, but are for the most part portions of machines: there are nevertheless some excellent specimens of forgings of very large dimensions, and which owe their excellence in finish and soundness mainly to the facility afforded in their construction by the application of the Nasmyth and other steam hammers: some of the large forged shafts are put together in longitudinal segments, which is another reason for their soundness. A complete revolution in the manufacture of large forgings has been effected by the steam hammer. The castings of large marine engine cylinders and other parts, the crank shafts, cross heads, connecting rods, &c., in wrought iron, as shown in the present exhibition, are such as never were produced of equally good quality on any former occasion.

SECTION IV.—VALVES, COCKS, PISTONS, GOVERNORS, DRIVING BANDS, &c.

Most excellent articles are exhibited under these heads, and by a large number of exhibitors. The valves and cocks are both good in design, and constructed of materials well suited to the purpose. Metallic pistons are now exhibited, having great facility of accurate adjustment against the sides of the cylinders, so as not to cause more friction than is absolutely necessary for preventing the passage of steam, and of very simple construction, and not liable to derangement. Governors are in great variety, but in most cases they partake of the objections to the ordinary ball and pendulum governor, viz: that they do not give a proportionate amount of steam for a varying load, with a maintenance of uniform speed; still, in some cases, this desideratum is obtained, and the examples are noted and described under their respective numbers. A decided improvement in driving bands is shown, both as regards materials and mode of construction, in leather, India rubber, &c.

C. T. Porter (United States) exhibits a governor having double elbow arms, the tendency of which is to raise a weight vertically upon the spindles. This governor is very sensitive, and mainly owes it to rapid rotation, which its peculiar construction requires. Mr. Porter also exhibits another governor, particularly applicable for marine engines; this is also a centrifugal ball governor, but the centrifugal force of the balls is met by a spiral spring, and is thus described by the exhibitor: "The novel feature in this governor, and that which gives to it its value, is the initial compression of the spring; for example, the spring is compressed two inches by the nut on the spindle. The circle in which the centers of the balls revolve is ten inches in diameter, expanding to one of fifteen inches in diameter. This expanding motion of the balls produces a further compression of the spring of one inch. The balls are shown in the engraving half expanded, and the spring, if released, would be two and a half inches longer than it appears. It will be observed that the expansion of the ball adds fifty per cent. to the diameter of the circle which they at first described, and also fifty per cent. to the original compression of the spring. If, therefore, the centrifugal force of these balls and the resistance of the spring are in equi-

librium in any position, they will be so also in every other position, the number of revolutions per minute remaining the same. The resistance varies by the increase or decrease in the compression, precisely as the force varies by the expansion or contraction of the circle."

M. A. Soul (U. K.) exhibits a governor which may be thus described: A fly wheel, having a long boss with a spiral groove cut in it, is placed upon a hollow spindle with a straight groove in it; inside said spindle is another which carries a pin as a driver to the fly wheel; if the spindle or shaft overruns the fly wheel, the interior spindle is moved in or out, as the case may be, and the movement is communicated to the throttle valve.

Schiele's governor, exhibited by the North Moor Foundry Company (U. K.), acts by water pressure upon a piston, given by a centrifugal pump. This governor can be made to exert great force, so as to be capable of acting directly upon the sluice or clow of a water wheel or other large valve; under ordinary circumstances, where great sensitiveness is required, an elastic diaphragm may be used instead of a piston.

Pneumatic Machines.

Section 1.—Air Pumps.

These pumps are principally represented by exhausting machines for creating a vacuum for the evaporation of syrups in the manufacture of sugar. They are constructed on a nearly uniform model. Each has a vertical steam cylinder with beam, connecting rod, and fly wheel; the pumps, two or four in number, and made of gun metal, are placed on either side of the beam. The construction of this machine has been scarcely modified for many years.

Apparatus of Doctor Normandy (U. K.), for the production of fresh water from sea water. The water is distilled by steam from the boilers of the steamship, or from a special boiler in sailing ships.

The apparatus is disposed in such a way as to retain, along with the steam from the evaporated water, all the air previously dissolved in this water and in that which is employed in condensation, which in the upper part of the condenser nearly reaches the boiling point. This total quantity of air exceeds that which fresh water can hold in solution, so that the condensation produces water perfectly aerated. The empyreumatic taste occasioned by the distillation has still to be got rid of, and this, it appears, is successfully accomplished by filtration through wood charcoal. The whole apparatus is simply and practically disposed; the evaporation is entirely self-acting, requiring only the regulating of some stop-cocks.

Steam Feed Pumps.

A great number of steam feed pumps are to be found at the exhibition, all with steam and water pistons on the same piston rod, sometimes vertical but more often horizontal.

Two pumps may be seen from the United States: Mr. H. Steel, and Mr. Worthington. They are without fly-wheels; one of them has only one steam cylinder and one pump; the slide valve is brought into action instantaneously at each stroke of the piston by means of a small supplementary steam piston, very ingeniously disposed. The other pump is com-

posed of two cylinders of each kind; the steam slide valve is guided in each machine by the piston rod of the other; by this means the movements are simultaneous in opposite directions, with perfect regularity.

To mention Giffard's injectors, exhibited by Messrs. Sharp, Stuart & Co. (United Kingdom), Flaud (France), is to record their success. They are found at the exhibition universally amongst the principal industrial nations, thus showing how this invention has been appreciated.

Professor Colladon (Switzerland) is the inventor of a water-wheel to be set in motion by large streams of water, and constructed on the most scientific principles. It is at present used for the raising of water; between two exterior cylindrical surfaces exists a spiral partition in which the water stands at the level of the axis, and can be raised to a height commensurate with the number of the spirals.

SECTIONS II. AND III.—REGISTERING INSTRUMENTS, AS GAUGES, INDICATORS AND TELL-TALES.

Great improvements have taken place of late years in articles under these heads, and have thereby contributed greatly to reduce accidents in steam boilers, by accurate notation of pressure, height of water, &c. The steam gauges exhibited are in most cases constructed with discs of thin metal, corrugated and plain, secured and made steam-tight at the outer edge, the pressure acting upon the surface, and the amount of deflection is communicated to a movable pointer, which indicates upon a dial the exact amount of pressure. Others are constructed with diaphragms of India rubber, the pressure being met with spiral or volute springs, and the motion communicated as above. The bent tube manometer of M. Bourdon is a most ingenious and correct indicator of pressure, and under all circumstances the best in the exhibition. Indicators and tell-tales of simple construction and practical utility are well represented. For the most part these are automatic, being self-acting for the regulation of feed water, and giving notice by whistle of conditions where it is necessary to call attention.

A. Achard, Paris (France).—Electro-magnetic safety apparatus. Medal awarded. Ingenious and original design. This machine is very perfect in its action, and in addition to its being a self-acting regulator of the supply of feed water to the boiler, gives notice by ringing a bell of any derangement under the following circumstances:

When the water is too low or too high.

When the steam is too high.

When the feed pump is out of order, and

When the apparatus itself ceases to act.

Charles Near, New York city (U. States).—Dynamometer, good arrangement, practical utility. Medal awarded. This is a very ingenious machine, but difficult to describe without a drawing; two pulleys are mounted upon a spindle, one being connected with the motive power, the other with the machine to be set in motion, one being loose the other fast; the former exerts its power upon an inclined plane which acts longitudinally upon two spiral springs, and these indicate their pressure on a scale or counter fixed to the framework of the machine. This counter, besides being actu-

ated by the force and motion of the driving pulley in a uniform manner, is caused to revolve in an increasing ratio as the pressure of force increases, by means of a cone which advances or recedes with the spiral springs, and which gives its motion to the counter by a friction roller.

J. C. Gore and Co., Jamaica Plains (U. States).—Belt shifter. Medal awarded. Originality of design; probable utility. A very simple and effective invention. The belt shifter is moved and locked by one motion, thereby preventing the possibility of accidental movement, so as to prevent the starting of any machine at an improper time.

Steam Fire Engines.—Three were tried and the committee remark:

The results of these trials show that although something has been done towards making a really serviceable steam fire engine, still much yet remains to be accomplished. These results show that a decided advantage is obtained in working fire engines by steam, as compared with manual power, but there appears on the part of all the makers a decided tendency to run their pumps too fast. The committee would also draw attention to improvements which may be made in many mechanical arrangements, viz.: in the size of the suction pipes, the supply chambers, and the valves, so as to give the greatest facility for feeding the pumps and preventing the return of the water.

Class IX.—Agricultural and Horticultural Machines and Implements.

The machines and implements are described in the body of the report.

Class X.—Civil Engineering, &c.

The report has not been received.

Class XI.—Military Engineering, Armor, Ordnance and Small Arms.

Eleven years only have passed away since Baron Dupin, the reporter of the combined Naval and Military Class in the International Exhibition of 1851, prefaced his remarks on ordnance with the observation that, as the main object of the exhibition was rather to make known the progress and to promote the arts that add to the comforts and enjoyments of life, than the powerful and destructive engines employed in war, such engines were not in place there.

Since that date two great European wars have run their course, and the attention of the world has once more been attracted to the development of the science of military engineering.

It is not surprising that, under the influence of this changed aspect of affairs, the present exhibition should present in its military department far more salient and interesting points of observation than its predecessor. It is no longer sufficient to combine military and naval questions in one small and comparatively unheeded class. The science of war now once more claims its right to a prominent place, even in a palace of Industry; and the Military court, with its Armstrong trophy, proves as great an object of admiration and interest to the multitudes who throng the building as any of its more peaceful rivals; nor indeed should it be considered

that this display of warlike engines is in any degree antagonistic to the interests of peace, since the truth is now universally recognized, that the greater the perfection attained in the art of destruction, the greater will be the likelihood of averting the calamity of war.

Regarded from this point of view, the present exhibition is most attractive and interesting. In no period of the same duration has so wonderful a progress been made in everything connected with the art of war as that which has marked the course of the last ten years.

Fortification.—Considering the vast array of weapons of destruction, the exhibition must be considered deficient, numerically at least, in works of defence; and it might hence be imagined that the ingenuity and resources of the one department had not kept pace with the inventions of the other. Yet an attentive consideration of the few models of fortifications exhibited in the English court (and nowhere else are any to be seen) will show that the science of defence has steadily followed the progress of its rival.

With the introduction of the rifled musket commenced the transition period of British fortification. The longer range of the new weapon enabled the engineer to extend the length of what is called a "front of fortification," that is, one complete system of parts, mutually supporting. Thus we see in the model of the Hilsea lines covering Portsmouth on the north, and where the bastion trace is still adhered to in modified form, the length of a front is extended from the normal measure, 360 yards, to about 620 yards. There is also a greatly increased amount of casemated cover given to men and guns.

The appearance of rifled cannon upon the stage was followed by a still more essential change in the trace of British fortifications. The long ranges attained by these formidable weapons made it necessary to throw far in advance of most of the works intended for the protection of a town, an arsenal or a dockyard; and thus a system of detached forts, supporting one another, and capable of being in most cases connected by subsidiary lines, took the place of the close enceinte. The model of Fort Tor affords an example of such detached forts. It illustrates also in its trace another divergence from established forms, consequent upon the progressive movement of artillery; for when, in addition to the great ranges of these guns, the extraordinary accuracy and destructiveness of their fire were developed, it became evident that the most vital portions of the defences might be destroyed in the earliest stages of the attack.* To guard against this cal-

* In August, 1860, an experiment was made of the power of the new service guns against masonry. A martello tower, near Eastbourne, on the Sussex coast, was selected as the target. This tower was built in 1802, of brick and mortar, which was found to be of good quality. On the land side, which was the point attacked, the wall was six feet thick. The distance taken up for the battery was 1,032 yards; the guns employed were:

One 80-pound gun (Armstrong).
One 40-pound gun (Armstrong).
One 7-inch howitzer (Armstrong).

A preliminary experiment was made to ascertain the depth of penetration by firing twelve solid shot or plugged shells; after which the operation was continued with live shell, and when twenty-nine of them had been fired the tower was found to be breached completely to a width of 13½ feet at the narrowest part, the result of forty-one shots, counting the nine preliminary rounds, and this gives an average of three shot per running foot of breach.

Up to this time the main operations of breaching masonry had usually been conducted with

amity, the long-established Vauban trace was abandoned, and we find in this model the ditches flanked by caponnières of masonry after the manner of the German schools; but in the case immediately before us the caponnières are snugly ensconced in the salient angles of the ditch, safe from everything but the operation of the miner.

Still there was wanting some efficacious mode of giving reasonable protection to the gunner in such batteries as are destined to take part in the earlier operations of the defence. Various modes have been suggested or tried for fitting such batteries with iron embrasures; but as yet it has not been found practicable to unite iron and masonry into a system capable of resisting the heavy brunt of modern missiles. To meet this emergency, Captain Du Cane, R. E., proposes to construct such batteries of iron alone. No. 2531 exhibits a model of a parapet of iron, formed of two thicknesses of iron slabs of peculiar form, which, by interlacing in an ingenious manner, form a wall of iron 16 inches thick. This system is entirely free from bolts, and is bound together by vertical ties of iron placed about 4½ feet apart. The embrasures are to be fitted with iron shutters of double action, so as to allow the greatest possible freedom of range to the guns with the least possible exposure to the men. Captain Du Cane shows also a model illustrative of the application of his system to bomb-proof batteries, towers, forts, &c., &c., of one story or more.

This mode of construction is presumed to effect so great a saving in space as to counterbalance the higher cost of the material. If this iron wall be found strong enough to resist the heaviest guns likely to be used in field sieges, it can be readily applied to existing fortifications for the purpose of protecting vital parts. In detached works it might form an impregnable keep, and it might be used alone, in the shape of isolated towers, to occupy advanced points of ground.

Great Britain—Ordnance.

The display of rifled ordnance, both breech and muzzle loading, made in the English court, is extensive and important, and deserves great attention from the variety of different systems exhibited.

The fact having once been established, that the accuracy and length of range obtained by the adoption of the principle of rifling, would render its introduction into the British army a matter of vital importance, the efforts of a great number of scientific men became at once directed to the removal of the numerous difficulties with which the question was beset. It was

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solid shot, and where the distances of the object exceeded the point-blank range of the guns the operation was tedious. Thus, in the article "Breach," in the English Aide Memoire to the Military Sciences, we find that, to form the main breach at Badajos, 180 feet wide, 14,800 rounds were fired from a distance of 560 yards; at Ciudad Rodrigo the main breach, 105 feet wide, was formed from a distance of 560 yards by the expenditure of 6,700 rounds, and at St. Sebastian the main breach was effected by 13,000 rounds from a mean distance of 650 yards. Captain (now Sir William) Denison, R. E., in commenting upon these and other breaching operations of the Peninsular war, observes: "From the foregoing it appears that a breach about 100 feet wide may be rendered practicable at a distance of 500 yards by the expenditure of about 10,600 24-pound shot fired at full charges," and this gives 106 shot per running foot of breach.

It is not intended here to compare modern guns with modern guns, but to show that before such ordnance as will henceforth take the field, exposed masonry is little better than cardboard for the purposes of fortification.

readily perceived that the ordinary mode of construction adopted for smooth-bore ordnance was not sufficiently strong to withstand the increased strain brought upon the gun when rifled. To gain the resistance necessary for this purpose, many different systems have been proposed, examples of almost all of which may be found in the present exhibition. Some have sought this additional strength in cast iron guns, simply by augmenting the mass of metal in the breech; but, although this method is still retained by some of the foreign inventors, it has not maintained its ground in this country. Others have proposed the addition of wrought iron hooping or wire, to strengthen the breech part in cast iron guns, and others again, abandoning cast iron altogether, have adopted the principle of guns constructed entirely of wrought iron, or of cast or hammered steel; the guns being in some cases forged solid and bored, and in others forged hollow. Lastly, may be named the coil principle; the gun being built up of numerous coils of wrought iron welded together and shrunk on in several layers or thicknesses at the breech. An equal variety has also been shown in the methods adopted for rifling the gun, both as regards the form and number of the grooves, and also the amount of turn given to the spiral, all, however, having the same object in view, viz., the imparting of a rotary motion to the projectile.

The fact that the Armstrong rifled cannon has been adopted as the arm of the service in Great Britain, has given great prominence to that weapon; and as a most complete display of its various parts, as well as of the finished gun in all the different calibres adopted by the government, has been made both by the Royal gun factories and also by the Elswick Ordnance Company, who manufacture Armstrong guns largely for the service, it will be necessary to enter into some considerable detail with respect to this important arm.

The Armstrong gun is made of wrought iron bars, coiled into hoops, which are then welded together, bored, and turned in a lathe, and built up into a gun by shrinking one over the other, and arranged so as to give the proper amount of strength to the various parts throughout the length of the gun.

It will be easily understood that the purpose of thus coiling the bars is to take advantage of the fiber of the iron in its best form, as regards the construction of a gun. The rifling consists of a large number of small grooves close to each other, and the twist varies in the different kinds of guns from one turn in thirty-eight calibers, to one turn in thirty calibers. The provision for loading the gun at the breech is made by cutting a slot near the breech end, down from the upper side into the bore, of a sufficient length to admit the elongated projectile and the charge of powder, and of a breadth slightly greater than the diameter of the bore. The bore itself is also slightly enlarged where it opens into the space formed by cutting out the slot, in order that the projectile and powder, after being lowered into the slot, may be easily pressed forward into the bore. In order to close the space formed by the slot, after the gun is loaded, a movable vent-piece is formed to fit into it, and is furnished with two handles, by means of which it may be lifted out or dropped into its place, as required. This vent-piece has fitted to its front face a plate of copper, a portion of which projects

slightly, so as to form a disc, which, when the vent-piece is forced a little forward, will enter the bore behind the charge, and by its expansion at the moment of explosion prevent all escape of gas. The slight forcing forward of the vent-piece is effected by means of a screw, passing in through the extreme breech end of the gun and pressing against the rear end of the vent-piece. This screw is turned by a hand lever. The fore end of the vent-piece is bored out at the center, the bore extending through the copper disc, and into this bore is placed at the time of loading a small discharging cartridge. The vent is formed in the vent-piece, passing down from the top into its bore; so that to fire the gun the detonating cap is struck, the discharging cartridge thereby fired, and its fire is instantaneously communicated to the main cartridge in the bore of the gun.

The projectile, whether shell or solid shot, is of iron, cylindro-conical in form, and surrounded with a leaden envelope attached to the iron by a zinc medium. The projectile thus coated has a larger diameter than the bore of the gun, consequently, when impelled forward by the discharge of the powder, the lead is forced into the grooving, and the projectile receives the required rotatory motion.

The principal dimensions of the various calibers of the Armstrong gun are given in the following table:

Nature of Gun.	Length over all.	Length from base ring	Length of bore.	Caliber.	Twist 1 turn in caliber	Weight with fittings.
	Inches.	Inches.	Inches.	Inches.		Cwt.
6-pounder	68.125	60.125	53.00	2.5	30	3.3
12-pounder	92.925	84.125	73.5	3	38	8.6
20-pounder	105	96	84.06	3.75	38	16.8
20 short	75.125	66.125	54.125	3.75	38	12.5
40-pounder	133	120	106.375	4.75	36.5	32.4
70-pounder	114	114	98.5	6.4	32	59.5
100-pounder	131.5	120	99.5	7.0	37	81.35
7 inch howitzer	100.5	90.125	75	7.0	38	53.3

The error allowed in the bores of all Armstrong guns is .005 above and .002 below the true caliber.

The charge of powder is in all cases one-eighth of the weight of the shot. The following table, taken from the Handbook for Field Service, gives some of the ranges of these guns:

100-*pounder, charge* 12 *pounds.*

Elevation.	Range.	Time of flight.
Point blank	345 yards	0.8 seconds.
1°	680 "	2.0 "
5°	1,970 "	6.8 "
10°	3,470 "	12.3 "

40-*pounder, charge* 5 *pounds.*

Point blank	360 yards	0.8 seconds
1°	730 "	2.2 "
5°	2,160 "	6.65 "
10°	3,835 "	12.6 "

20-*pounder, charge* 2 *pounds* 10 *ounces.*

Point blank	250 yards	0.8 seconds.
1°	510 "	2.0 "
5°	1,850 "	6.4 "
10°	3,250 "	11.9 "

12-pounder, charge 1 pound 8 ounces.

Point blank	330 yards	1.2	seconds.
1°	680 "	2.1	"
5°	1,940 "	5.9	"
10°	3,100 "	11.6	"

The first operation in the manufacture of the Armstrong gun is the welding of the bars of iron, as they come from the makers, into the proper length to suit the various diameters of the coils. These bars are of the best description of wrought iron; their section is rectangular, and their length vary from 12 to a hundred feet, coils having been made of bars of 120 feet long.

The second operation is that of coiling the bars. This consists of heating them, and then winding them round a mandril in a powerful machine. The coil is then heated to the welding stage, and thoroughly welded under the steam hammer. The next operation consists of uniting several of these coils together into one tube. The coils, as they come from the hammer, are between two and three feet in length. They are first truly faced at the ends in a boring machine, and formed with a recess and projection alternately, so that the end of one coil fits into that of another. Four of these coils are thus put together and taken to the uniting furnace. The furnace has two large holes in its sides, through which the tube is passed; these holes are banked up with loam, and the intense heat soon brings the joints of the tube to a welding heat. A long bolt is then passed through the interior of the tube. The ends of this bolt are fitted with six large nuts, which, by means of clamps, are brought to bear on the outer ends of the tube. A long and powerful lever is then applied to the nuts, the bolt is tightened, and the two coils are compressed into one. This operation is repeated until the four coils are compressed into one. The second tier of coils are united in a similar manner. The length, however, of this tier is not all composed of coils, but terminates at the breech end with a large forging made in the solid under the steam hammer. The two barrels having been turned to the proper dimensions, the outer barrel is shrunk on the inner. To permit of this shrinking process being properly carried out, each coil is so finished that it will not go on its seat on the gun until it has been expanded by heat.

After the two barrels are shrunk together, the gun is again turned to receive the next tier of coils. These coils are not united together, but, after being bored and turned, are heated and shrunk into their places in the respective tiers, until the formation of the whole gun is complete. The trunnion piece is forged solid, and also shrunk on. The gun is then returned to the boring mill, and rifled by a machine. Its powder and bullet chambers are then finished, and its breech end screwed for the reception of the breech screw, and the slot cut for the vent-piece. The gun is then fitted with sights, and the breech screw and vent-piece being added, it is ready for proof.

Each gun is fitted with two sets of sights, viz: the center sights for short ranges, as in the old service guns; and side or tangent sights for the longer ranges.

The tiers of coils displayed, on the trophy of the Royal gun factories, vary

in diameter from about thirty inches to twelve inches. Each tier contains four coils of the same diameter, but in different stages of manufacture, viz: coiled, welded, finish-bored, and turned. Specimens are also shown of the long tubular coiled forgings, and also of the bars from which they are made.

One of the most interesting objects in this collection is a tube, rifled with four grooves, all differing from each other, and each possessing its own peculiar features.

No. 1 represents what is known as the shunt groove, the invention of Sir William Armstrong, for application to muzzle-loading guns. The peculiarity in this groove lies in the suddenness of its shunting or contracting from a broad to a narrow groove at a particular part of the bore; and also the irregular depth of the groove, which is a gradual taper.

The other grooves are for the purpose of showing the capabilities of the rifling machine, and consist of

No. 2 groove, of a zigzag from right to left throughout the whole length of the tube, the bottom of the groove being parallel to the bore.

No. 3, a twisted groove, undulating in depth at given distances.

No. 4 is a curvilinear zigzag groove, also undulating in its depth, its sides being of a regular irregularity. A large coil is exhibited, made from a bar of more than 100 feet in length, and a turning or shaving is also shown within this coil, which, if opened out, would reach 1,200 feet in length. This shaving and a number of cuttings of chips, which are exhited in a glass case, with the remark that "a workman is known by his chips," mark the excellent quality of the iron used in the manufacture of these guns.

The Whitworth Ordnance Company made a very complete display of artillery, upon their hexagonal bore system. The Whitworth gun is made of what is termed homogeneous iron, somewhat approaching in character to hammered steel. The gun is forged solid, and afterwards bored. The larger guns are strengthened with wrought iron jackets, forced on by heavy pressure. The projectile is originally cylindro-conical, with its surface afterwards planed off into a hexagonal shape by six cuts. The bore is in reality twelve sided, one-half of each of the sides of the hexagon being cut away to facilitate the passage of the projectile into the gun. The pitch of the rifling is in all cases equal to twenty times the diameter of the bore, and the charge of powder is one-sixth the weight of the shot. No special fuse is required when firing shell, as the flash of the explosion ignites the fuse in the front, placed and used like the ordinary time fuse.

In small arms, both for military and sporting purposes, the change that has taken place since 1851 is worthy of note.

In the British army we find that the old smooth bore musket has been replaced by a rifled musket of superior quality, lighter and smaller in the bore.

In the cavalry, breech loading rifled carbines of small bore, viz., .450, much lighter than the old smooth bore carbine, are under trial, with a view to their adoption in the service.

Small arms for the British army are partly supplied from the government factory at Enfield, and partly from private sources, such as the London

Armory Company, and the Military Trade Association at Birmingham; some are also purchased from the foreign manufactories of Liége, in Belgium, and St. Etienne, in France.

The government factory at Enfield carries on its operations principally by machinery, specially adapted for the object of manufacturing the same parts with undeviating accuracy at all times, thus securing the great advantage of making them interchangeable.

Part of the machinery in use has been brought from the United States, but in many instances this has been improved upon, and in some cases new machinery, not known in America, has been introduced. This machinery, though made principally for the manufacture of the Enfield rifle of the pattern of 1853, can nevertheless be so adapted as to turn out rifles of any pattern, by slight alterations. At the present moment, rifles of five different patterns are being made at this factory.

When the machinery is in full work, it employs 2000 operatives, and this number can turn out 2000 rifles, complete in every respect, per week of 56 hours. The following table shows the number of parts of which the Enfield rifle is composed, and also the number of different operations required in the manufacture of those parts, all of which are exhibited in their separate stages, and in consecutive order, commencing with the raw material and continuing the sequence to the final stage of the completed weapon:

	Parts.	Operations.
Barrel	8	78
Bayonet	4	66
Furniture	18	202
Lock	12	137
Sight	8	74
Screw and Nipple	15	192
Stock	1	25
Total	61	774

The following are the principal dimensions of the English rifled musket, the arm in general use amongst the British infantry of the line, militia and volunteers. Barrel—length, 3 ft. 3 in.; diameter of bore .577 in.; rifling grooves, 3; spiral, 1 turn in 6 ft. 6 in.; length of musket, 4 ft. 6 in.; weight, 8 lbs. 8 oz. Bayonet—length beyond muzzle, 1 foot 5½ in.; weight, 11 oz. Arm complete with bayonet, length 5 ft. 11½ in.; weight 9 lbs. 3 oz. It is sighted up to 900 yards, but its practice is good at a longer range. The ammunition consists of an elongated ball with boxwood plug, weight 530 grs.; diameter .55 in.; charge, 2½ drs.; weight of 60 rounds with 90 caps, about 5 lbs. 9 oz.

The Enfield factory has further made an interesting display of every small arm in use in the British army at the present time, and they also exhibit a very ingenious armorer's field forge, the invention of Mr. Dodd. This forge includes a complete set of armorer's tools, with a carpenter's bench, a smith's fire pan, bellows, vice and anvil; the whole being so constructed and arranged, that they can be packed in a single case, which itself forms the bench, and the support for the vice and fire pan when in use. It is extremely compact and portable, considering its completeness.

FRANCE.—In the French department no display whatever of artillery

has been made, the exhibition being confined exclusively to small arms, and those the results of private enterprise only.

In the French official catalogue the following note has been inserted to account for this absention:

"The articles exhibited in this class give but an imperfect conception of the productive power of our country; the Imperial manufactories having refrained from exhibiting, in order to give up entirely to private industry the limited space allotted to France."

It may not, however, be uninteresting or out of place to state here that the French government have adopted in their artillery the system of rifling proposed by Colonel Treuille de Beaulieu. The name of this officer stands prominent amongst those who were early in the field, as advocates of the necessity for the introduction of rifled artillery; and his system permits of its application to existing smooth bore guns, an advantage which has led to its adoption by more than one of the governments of Europe.

For field service, the ordinary brass muzzle loading gun of the French artillery is rifled with six shallow rounded grooves, the projectiles being of a cylindro-conical form, with twelve zinc studs attached in pairs, two to each groove.

For the heavy artillery, three centrical grooves have been adopted, the gun being strengthened at the breech with wrought iron hoops, and the projectiles, also cylindro-conical in form, having three large studs composed half of zinc and half of iron.

In both these descriptions of ordnance, the ordinary spherical ball can be used, the gun being as available for smooth bore as for rifled practice. In the late campaign in Italy, where the field guns were brought to the test of actual service before the enemy, they were used under both conditions, and with the most favorable results, when compared with the practice obtainable under the old smooth bore system, to which they were there opposed.

In the department of small arms, contributions have been sent by all the most eminent gun manufacturers both in Paris and St. Etienne, and the display is one which reflects the greatest possible credit upon the gunmakers of France.

SWEDEN.—Sweden has taken a prominent part in the question of rifled artillery, and her inventors were early in the field with proposals for its adoption. Baron von Wahrendorff, the former proprietor of the Aker cannon foundry in Sudermannia, brought forward a plan of breech loading as far back as the year 1842; and he subsequently proposed a system of lead coating, affixed mechanically to the sides of elongated projectiles, to enable him to rifle his guns on the compression principle. A specimen of this gun is exhibited.

The breech-loading action consists of a bolt, oval in section, passing through the gun in a horizontal direction at the breech, and supporting a plug, from which a handle extends to the rear of the gun, through which the bolt passes. When the gun is to be loaded, the bolt is withdrawn, and the stopper pulled out by its handle, leaving the bore open to the rear. When loaded, the plug is returned into the gun, the bolt shot through it, and the two set tightly together by the turn of a screw on the handle which projects out of the rear of the gun.

The gun is of cast iron, rifled with twenty-two grooves, carrying a conical ball of 14 lbs., with a charge of 2 lbs. powder; the weight of the gun being about 15 cwt.

Small arms were exhibited by Austria, Norway, Russia, Switzerland and Holland.

Class XII.—Naval Architecture.

The comparatively short period that has elapsed between the last and the present International Exhibitions will be always memorable in the history of the world, as having witnessed greater and more important changes in naval architecture, in its application to purposes both of national defence and commerce, than have taken place in any previous equal interval of time. In the year 1851 few steam frigates were in existence; now they are numerous. At the former period their dimensions and horse-power were limited, and their speed far from satisfactory. This country now possesses frigates, built of timber, of from 250 to 300 feet in length, and from 600 to 1,000 horses' power, and capable of attaining a speed of thirteen knots an hour; and even this class is being rapidly superseded by another, of a novel and still more powerful description. There was in 1851 but one steam line-of-battle ship, the "Napoléon;" there are now, in this country and in France, extensive fleets of such ships, comprising both two and three deckers. Not only have line-of-battle ships, of three and two decks, been designed and built especially as steam ships, but many, indeed almost all, of our useful sailing line-of-battle ships have been adapted for the reception of engines and screw propellers. Some of them have been lengthened in midships to give the additional displacement corresponding to the weight of the machinery and coals intended to be put into them. The first instance of this was in the spring of 1852, when the "Windsor Castle," now the "Duke of Wellington," 120-gun ship, on three decks, on the stocks at Pembroke, had twenty-two feet added to her length in midships, and was prepared for screw engines of 700 horse-power. These adaptations have been in all cases eminently successful, the ships thus lengthened having proved themselves to be good sea boats, and realized speeds under steam equal to those of the earliest of the screw frigates. In many of the line-of-battle ships, particularly of the smaller classes, the principal alteration has been to cut an aperture in the after dead wood for the reception of the screw propeller. Within the last three or four years the sailing fifty-gun frigates of England have also been converted into screw steamers. Thus this country has, between the years 1851 and 1862, witnessed the mighty transformation of her sailing fleet into a steam navy of unrivaled power and magnitude.

During this period there has been a gradual increase in the dimensions, more especially of the length, of newly constructed steam ships, which has admitted of an improvement of the lines both forward and aft, and produced a corresponding improvement in the performances of these ships, both in steaming and sailing, as compared with their predecessors. The line-of-battle ships "Duncan," "Victoria" and "Howe," and the frigates "Ariadne," "Mersey" and "Orlando," models of which are exhibited,

may be mentioned among others as notable examples of this progress in steam naval construction.

In the years 1855 and 1856 political necessities created a sudden demand for vessels of war of small dimensions and light draught of water; and in about eighteen months a steam gun-boat navy of about 160 sail, with a large number of wood and iron mortar-boats, was called into existence. These gun-boats, as is well known, have proved of incalculable service in maintaining the honor of the national flag in distant parts of the globe. It is not, however, to call attention to these vessels—valuable as they have proved—as specimens of naval architecture, that this notice is taken of them; but to show what can be done in the present day in improvising means of naval defence by the energy and genius of great maritime nations.

A most important innovation in the construction of men-of-war was inaugurated by the Emperor of the French in 1854. Experience having shown the uselessness of wood ships when exposed to shell firing from forts, he devised a new class of steam vessels, to be armor-plated, and employed as floating batteries. These vessels being of small dimensions and horse-power, and necessarily of very bluff shape, were not adapted for sea-going purposes; but they realized completely, by their invulnerability under fire, the expectations of their imperial inventor. England lost no time in following the example of her ally, and eight armor-plated batteries, five of wood and three of iron, were added to the British fleet.

The possibility of applying this new principle of defence to sea-going ships of war henceforward occupied the attention of nautical men. It had long been felt that some better protection than wooden sides against shells and other combustible projectiles was needed; but whilst one of the principal maritime powers was making great efforts to increase the number and efficiency of its wooden steam fleet, no other could prudently cease its exertions to maintain its relative position in this respect, which it must have done had it alone devoted the national energies and resources to the costly and tedious undertaking of creating an armor-cased navy. This momentous question appears, however, to be settled. Frigates, armor-cased and of great capabilities, are now beginning to form the nucleus of the navies of England, France and other countries, and the construction of ships of war not intended to be armor-cased is being generally given up.

In the year 1860 "La Gloire" in France and the "Warrior" in England—the first armor-cased sea-going men-of-war the world had seen—were launched; and since that time the number of armor-cased frigates in the two countries, either built or in course of building, has increased to about thirty.

Perhaps there is no subject which has engaged the minds of men of a mechanical turn, within the last year or two, more than that of the armor-plating of ships. Starting from the assumption that the mode hitherto adopted was faulty in principle, they have devised a variety of plans to give to the plates greater resistance to shot, and greater security. Some have advocated elastic backing, some, angulated or corrugated forms. But the grand endeavor has been to find a plan to dispense with the fastening bolts, which were considered, by partial observers, to be a principal

cause of weakness. To test these various plans no pains or expense have been spared by the government. A special committee on iron plates has been appointed, to whom they have been generally referred; and in several cases targets have been constructed at the public expense, on the principles proposed, and experimented on at Shoeburyness by being fired at. Among the rest, one which was a fac-simile of an equal portion of the side of the "Warrior" was thus tested, and proved beyond dispute superior in resisting power to any that have been tried before or since; and not only so, but completely impervious to the artillery and projectiles that could be employed against it. The thickness of the armor-plating was four and a half inches, and of the wood backing eighteen inches, which was very nearly the same as those of the "Gloire," the fastenings in both ships being common through bolts and screwed points.

Another very important fact to be noticed is the almost universal substitution, since 1851, of iron for wood as the principal material for ship-building. For many years past the number of iron ships built for commercial purposes had been steadily increasing, but during the last ten years the increase has been so rapid as to lead us to anticipate that at no distant period the building of wood ships of any considerable size will be discontinued.

Firms of long standing, and of high repute as the builders of wood ships, have yielded to the requirements of the age, and have found no difficulty in training their skilled mechanics to the comparatively easy handicraft required in iron ship-building.

Iron, as a material for ship-building, possesses great advantages over wood. Putting aside the question of first cost, there can be no doubt that an iron ship, originally well built and afterwards carefully attended to, may be said to be practically indestructible, except by the contingencies to which all ships must be liable. The decks are the only portions subject to early deterioration, and these no more, probably less, than decks laid upon wood beams.

Moreover, with the same weight of material, judiciously disposed and properly fastened, it is posible to make a much stronger fabric of iron than could be made by any mechanical combination of wood.

In England, the substitution of iron for wood in ship-building may be easily accounted for on other than the above considerations, advantageous as they appear. English timber suitable for building large first-class ships is scarce, and commands a high price; ship-builders are therefore driven to foreign markets for their supply, markets which, from unforeseen political causes, may be closed before the completion of existing contracts. It is not to be wondered at, therefore, if—repudiating old prejudices—they should choose, as the staple article of their business, a material of which they can find inexhaustible supplies at home.

To the advantages above spoken of, there is, however, one serious drawback. Modern science and ingenuity have not hitherto discovered an effectual means of preventing, at the same time, the oxidation of the bottoms of iron ships and the adhesion to them of weeds and shells. The latter of these evils cannot well be exaggerated, as it materially affects the commercial value of every such vessel, from its increasing on every

voyage, not only the length of time and consumption of fuel necessary to its performance, but also all concomitant expenses.

That this evil has been fully recognized is evident by the ingenious plans for floating docks, adapted for all parts of the world, shown by models in the exhibition. The urgent necessity for these floating docks, or something equivalent to them, at points of the routes traversed by iron ships, may likewise be seen from the fact that such ships are far more vulnerable below the water than ships built of wood. A wooden ship taking the ground on a hard uneven bottom might remain water tight, though her bilge planks were rubbed half through by an obstacle which would penetrate the bottom of an iron ship. It is true that in the latter case the water-tight bulkheads might protect the ship from immediate danger, but they would not avert the necessity of repairing the damage as speedily as possible.

Since the last International Exhibition the screw propeller has in a great measure superseded the paddle-wheel in ships destined for ocean voyages. Very few large paddle steamers are now built. Some, however, have been built during the last ten years whose performances have been so remarkable that it would seem improper to pass them over in silence.

Of these are the "Persia" and "Scotia," built for the Cunard Company by Messrs. R. Napier & Sons. The "Persia" is 360 feet long, 45 feet broad, and 3580 tons. The "Scotia" is 370 feet long, 47 feet 6 inches broad, and of 4050 tons. These ships have made the most regular and rapid passages on record across the Atlantic.

The "Connaught," built by Messrs. Laird and Sons for the Dublin Steam Packet Company, attained a greater speed on her trial trip than any vessel yet built. This ship, 350 feet long, 35 feet broad, and of 700 horse-power, made, as the average of four runs, 18.079 knots per hour. The "Leinster," built by Messrs. Samuda for the same company, made, as the average of four runs, 17.797 knots. These results we think worthy of being put on record here.

Perhaps, however, the most striking feature of the period of which we are writing has been the building, launching, and ultimate success as a sea-going ship, of the "Great Eastern." This ship is so exceptional in her general character and her colossal dimensions, that all we can do is merely to allude to her without comparing her performances with those of other vessels. She was the joint design of the late Mr. Brunel, and Mr. J. Scott Russell, her builder, who has, in her construction, embodied his wave-line principle. Her general characteristics are so well known that they need not be particularized. We only remark that the building of this ship forms an epoch in the history of naval architecture, and that she remains a monument of the mechanical skill and commercial enterprise of the nineteenth century.

Class XVII.—Surgical Instruments.

I. The most remarkable additions to general surgery since 1851, which receive illustration in the present exhibition, are: Improved means of investigating and treating surgical disease; the use of the permanent bath as a means of preventing excessive inflammation after injuries and burns, and in acute diseases of the joints, skin, &c.; the antiphlogistic employment of dry cold by means of non-conducting caoutchouc, on the principle of

Esmarcn; improved methods of treating fractures without extension, by means of pasteboard, gutta-percha, plaster of Paris, and other plastic materials, admitting of exact application to the contour of the injured parts; the revival of the excision of joints; the radical cure of reducible hernia; new methods of external and internal urethrotomy; ingenious means of extracting foreign bodies from the urinary bladder, *per vias naturales;* the revival of median lithotomy, by Allarton; improved methods of lithotrity; the gradual establishment in the estimation of surgeons of the operation of ovariotomy; the successful closure of recto and vesico-vaginal fistulæ; the employment of metallic sutures; the division of vascular tissues without hemorrhage, by *écrasement linéaire;* the revival, with some modifications, of the older methods of treating aneurism; the treatment of the same disease by coagulating injections and by pressure; accupressure as a means of arresting hemorrhage; and, among the minor additions, subcutaneous injection for the relief of pain.

Selecting a few only of the newest and most important of the instruments exhibited, and giving the preference to those which appear to combine the greatest degree of efficiency with lightness and simplicity of construction, the jury may mention, among the apparatus for *club-foot*, shoes having movements coincident with those of the ankle joint; apparatus intended to be worn after division of the tendons (founded on the theory that one common osseous center of motion exists in every case of club-foot), and in which the three movements of flexion, rotation and abduction are produced by a single ratchet (Bigg); and another by the same maker for *severe adult club-foot*, in which one ratchet center is placed opposite the cuboid bone to secure abduction, a second against the malleolus to induce flexion, and a third above the ankle joint, rotation of the whole foot. Among the exercising apparatus, instruments with provision for everting, as well as elevating the toes (Dr. Little). For *contracted joints*, some for raising the wrist, one for its lateral extension (on the principal of Mr. Hancock), and one having the anterior and lateral motion combined; instruments to correct the *abnormal position of the radius and ulna*, and an appliance constructed on the indications of Mr. Longmore for *contracted elbow;* an instrument for restoring the worst kind of *contracted knee* (inversion and dislocation of the tibia backwards), which is both simple and powerful; and another to *resist lateral motions of the knee* where the ligaments are relaxed. Apparatus for the exercise of joints, and one for exercising knock knees during the hours at which the permanent instrument is laid aside (Ernst). Apparatus (by Bigg) *to compensate for the loss of muscular power*, in which the hip, knee and ankle are acted on by strong elastic cords to imitate muscular contraction, as well as a new mode of detaching the boot by means of a ring catch (by Ernst). Instruments by Mathieu, Charrière and Lebelleguic, for *spinal curvature;* and one (by Bigg) for *double lateral curvature*, so contrived that its centers of motion are in agreement with the axes of each separate curve, so as to secure an action exactly opposite to that of the morbid deflection; an apparatus *to overcome rotation of the ribs upon the vertebral column* when combined, as it almost always is, with lateral curvature; and an instrument for *wryneck*, the advantage of which is, that instead of the head being received, as is usual, in a semi-circle of metal,

within which it may easily rotate, it is fixed and acted upon by a double purchase obtained upon one or other of the parietal walls and the chin, by which it is rotated and elevated simultaneously (all by Bigg). Among the artificial limbs, a leg invented by Dr. Bly (America), which allows both lateral and rotative movement, and permits the patient to walk equally well on smooth and uneven ground, deserves special mention; as do the crutches and all the contrivances for the *supply of lost parts*, by Masters; the manufacture of artificial limbs by this maker leaving nothing to be desired, whether lightness, form or solidity is regarded. Particular articulations for the lower extremity, by Béchard and Grancollot, and one for the knee, by Lebelleguic, are also worthy of commendation. With these, for mere want of space, the notices of the jury must cease; in no department of the exhibition have they observed greater evidence of progress or greater perfection of manufacture.

Ophthalmic Surgery.—It cannot be doubted that ophthalmic surgery has made immeasurably greater progress during the past than during any preceding decennium. The invention of the *ophthalmoscope*, by Helmholtz, in 1851, marks the commencement of a new era in this branch of surgery. Its application to the diagnosis of the diseases of the internal coats and transparent media of the eye, together with the great attention which has been given to the cultivation of the morbid anatomy of this organ, have yielded much exact knowledge concerning many affections which were previously imperfectly understood, or even misinterpreted, and have already reduced into some order the chaos of *amauroses*, so perplexing to students of eye disease. The limits of this report do not allow the jury to mention particularly all the improvements which Helmholtz's invention has undergone; but they cannot pass, unnoticed, the *binocular ophthalmoscope* exhibited by Nachet, of Paris. The adaptation of the binocular principle to the ophthalmoscope, is yet too recent to allow them to offer an opinion of the degree in which it realizes the expectation of its designer; but they would indicate, as a great desideratum, a means of diminishing and increasing the distance between the sight-holes, the want of which is likely to limit the general use of this form of instrument for diagnostic purposes.

Class XVIII.—Cotton.

The jury of Clas XVIII, which has been charged with the examination of that large branch of industry comprising cotton yarn and cotton cloth, regrets that it cannot make a full comparison of the manufactures of all the countries in which that manufacture is carried on, as the exhibits of cotton yarn especially are very incomplete. The Zollverein, which is known to be very much advanced in this latter branch, has hardly a single exhibitor. The comparison therefore, as to the degree of advancement of the several countries, cannot be regarded as sufficiently complete.

Universal exhibitions would lose a considerable part of their usefulness if the great manufacturers of every nation did not feel it to be their duty to associate together, and take their part in the work of improvement (which such exhibitions cannot fail to effect) by sending specimens of their several productions.

The jury has to remark generally, that great improvements are observa-

ble in the cotton manufacture as compared with the former Great Exhibition. The use of the most improved machines, common in Great Britain in 1851, has become more general in Europe, and has tended greatly to equalize the productions of nations. The introduction of the combing machine, a French invention of surpassing ingenuity, has produced a complete revolution in the manufacturing of the finer numbers of yarns, and has rendered attainable, without any great difficulty, a degree of perfection which previously was almost impossible.

Class XIX.—Flax and Hemp.

In order to give to the report, claimed by the Royal Commissioners, an interest as worthy as possible of the International Exhibition, the jury of the nineteenth class have thought that, after having made a brief and impartial analysis of the comparative progress of the different countries, the products of which they have examined, it would be proper to inquire into the causes, nature and importance of such progress, and, for the benefit of the especial industries of the nineteenth class, to show the result of the facts appreciated by the jury. Considering the questions relative to hemp, flax, jute, and other similar fibers, the jury have been struck at the difference which occurs in the rapidity of progress and extension in the manufactures of these various materials in the same country. If we take for instance the United Kingdom of Great Britain, we observe that the manufactures from flax and hemp are far from increasing in the same proportions as those of wool and cotton, while the manufacture of jute, which continues daily to increase, has been extended in a comparatively short period to an extraordinary degree.

Preparation of the Fiber.

In the fibers prepared by the agricultural means commonly used, the jury have observed some fair English flax coming from Yorkshire, and also some very good Irish. Both England and Ireland appear to have made considerable improvements in the cultivation and after-management of flax. Belgium and France maintain their very high rank. Prussia has also exhibited some very good samples.

The jury have ascertained, with interest, that the process of steeping by the hot-water process, known under the name of Shenk's patent, continues to be employed with advantage in Silesia, where the ordinary steeping is not so carefully or successfully attended to as in some other countries, such as Belgium and Ireland. But what has generally struck the attention of the jury is the fibers, yarns, and cloth of attractive appearance and superior quality, which are obtained from ordinary flax, treated by the Belgian process of Lefebvre. The fibers prepared by this process keep the regularity, the brightness and strength which are characteristic of superior finished yarns. They are refined, divided, and prepared in such a manner that the yarns and cloth made from them are sufficiently white for partial bleach without being creamed.

Bender, of *Bleicherode* (Russia), has also exhibited some fair looking flax, prepared by a process, as he says, a cheap one, and not chemical, which process he for the present reserves as his own secret.

Italy and the Grand Duchy of Baden have sent some very beautiful samples of dressed hemp.

GENERAL REMARKS ON THE STATE OF THE LINEN MANUFACTURE.

One of the results of the observations of the jury of the 19th class is, that the manufacturing industry of flax and hemp, as regards the extent of machinery now employed, and consequently the quantity of goods actually produced, is far from having made the same active progress as several other branches of textile manufacture. It has even remained almost stationary. The numbers of spindles mentioned in the report of the jury of the International Exhibition of 1855 does not seem to have much increased in any of the countries distinguished for linen manufacture. The important manufacture of jute, which has been already alluded to in the preceding report, forms, however, one striking exception to this general rule. On inquiring as to the causes of the striking difference, we notice in the first place, that though flax is a material most easily adapted for spinning yarns, being produced, by hand labor, quite equal to silk in fineness, and though the raw material of flax in the state of fiber is about the same price as the better kinds of cotton, the yarns produced from flax by machinery, taken in equal length for the same weight of fiber, appear to cost the most of all.

We must also acknowledge that it is only with the greatest difficulty that flax spinners have been able to produce by machinery yarns of an extreme fineness, though still inferior in this respect to the fineness of the cotton yarns. As a principle the fundamental operations for the spinning, except perhaps the preparation of the raw material, are the same for all fibrous substances. The combing or carding, the drawing and spinning, constitute, without any important distinction, these various operations. Still such will cost much more for some one of these materials than for others; even though this material may not possess a nature deficient in spinning quality.

The cause of this difference is that the more costly fabric is produced from material which is worked with greater practical difficulty, and requires more effort to complete. This is especially the case with flax, the machinery for which must be decidedly stronger than that used for cotton, and the whole flax spinning system must also have much more steam power applied, in consequence of the flax fiber not being sufficiently purified and freed from all heterogeneous substances, which of course present an obstacle to the sliding or drawing, the base of all spinning operations.

On the present occasion we shall endeavor to give some explanation on the subject of steeping flax, steeping being the principal process by which more or less softness and purification of the fiber may be obtained.

The great fault in the flax fiber is the excessive quantity of gum, which is not extracted by the present steeping process. When a new process shall be discovered to remove completely this objection, there is no reason why flax fiber should not be spun as easily and as fine as cotton. It is to be hoped also, by such improvement, that we may eventually obtain a class of yarns more elastic, and that the cloth made from them may weave more readily, and in the end give greater satisfaction and durability.

If we pass from the flax fiber to that of hemp, and other similar substances, we find the hemp inferior to flax in softness and minuteness of subdivision, making it more difficult to spin; we find also that China grass has the same defect in a much higher degree, while it is also much more costly.

If jute manufactures have made such rapid progress, it can be easily accounted for by the low cost of the material, combined with a considerable amount of spinning quality.

We may remark, before concluding these reflections, that great attention is now being given to the flax steeping process, and in consequence the real cause of the deficiency of the fiber for the spinning process, as explained above, has thus become every day more generally known. We may hope, therefore, that at no late date the process of steeping will be improved to an extent equal to the great progress which the other manufactures dependent on the aid of chemistry have already made.

CLASS XX.—SILK.

The silk manufacture in Europe is of considerable antiquity, its introduction dating from the thirteenth to the fifteenth centuries. Depending so much on mild and uniform temperature, the difficulties of acclimatizing the worm and the source of its food—the mulberry tree—have often been insuperable. When, however, these have been surmounted, as more especially in Italy and France, the profit has rarely failed to reward the adventurers. But it is an industry of slow growth, requiring great care and involving much dead capital.

The manufactured article is susceptible of important adaptations, as well for the splendid garments of the luxurious and the wealthy as for the economic decoration of the humbler classes. From the Queen on the throne, resplendent in all the magnificence of damask and many colored brocade, to the factory girl who can afford to purchase a dress of plain or checked Gros de Naples, silk is the material which, beyond all others, may be made to suit the tastes and pecuniary means of nearly all grades of civilized society.

A glance in the International Exhibition at the many forms manufactured silks assume, and at the many textures into which it is more or less incorporated, demonstrates the fact that modern discoveries and inventions have opened up channels for its use, of which, but for this extraordinary opportunity of seeing for ourselves, we could scarcely have formed a conception. The demand, therefore, for the raw material, has been rapidly increasing, while, like its rival necessity, cotton, but from a very different cause, the supply of late has been comparatively scanty. In the one case a most disastrous and unnatural war has closed the channels of export to Europe, while in the other a disease as mysterious in its origin, progress and agency as the cholera, has destroyed myriads of worms in the silk-producing districts of Italy, France, and elsewhere on the continent.

But severe as are these trials, they are not unmitigated evils, and afford additional illustrations of the theory, as paradoxical as it is true—that war, pestilence and famine are more frequently than otherwise the harbingers of improved civilization, open up new fields of production, and give to

the resources of art and science larger scope for profitable development. It cannot be doubted that when the American ports are again thrown open to the commerce of the world, cotton cultivators and merchants will find that in the European markets, which they have so long abandoned, they will have seriously to cope with other and newer producers in far-distant climes, who have been encouraged and stimulated to competition by the prices their cotton has commanded during the years of famine. So of silk; China and Bengal have come to the rescue, and have not only supplied to a great extent the vacuum occasioned by the devastating worm disease, with the raw material, but millions of eggs from the vast regions of Asia have been exported to Europe, where, by crossing enfeebled breeds with the more healthy and hardy races of the far East, the foundation has been laid for an ultimate supply of silk larger in quantity and better in quality than was ever before known.

It will also be found that a new and formidable producer has recently entered the field of competition. Japan, whose many natural resources are beginning to be understood, is already giving earnest of an intention to achieve for itself a position as a commercial country.

United Kingdom.—The number of exhibitors is fifty-nine, to thirty-three of whom medals have been awarded, and of fourteen others the jurors make honorable mention; thus affording pretty strong evidence of the prominent position this important manufacture is entitled to occupy in this and other countries.

After alluding to the loss of the cotton supply, and the markets of the United States, by the contest still going on, the following remarks as to the advance made in England since 1851 will be interesting:

In the midst of all these discouraging impediments, there is a redeeming feature which will make itself felt when trade revives, and that is the remarkable progress which our silk manufacturers have made since 1851, and even since 1855, in all that constitutes superiority. Whether in design, color or texture, or the whole combined, we compare the specimens of silks in the English department with what were exhibited in those years in London and Paris, the improvement is immense. To single out any for special notice would be to make an invidious distinction where there is so much general excellence. The articles in which this improvement is perhaps most obvious are moirés antiques, and fancy goods of almost every variety that is exhibited. But if all this applies to broad goods, much more so does it to the ribbon branch. Coventry has made strides for which we were not prepared, and their portion of the exhibition rivets the attention of the most careless visitors, be they natives or foreigners. In no respect are they, as a whole, inferior to those of St. Etienne, while as compared with the productions of Switzerland and the Zollverein, they are much superior.

It is true that for the type of fashion and taste our manufacturers must still look to France, for it is there that the former yet holds its court, and those producers in England must be bold who seek to originate and aim at establishing another tribunal. Such courage may ultimately succeed; but it should not be forgotten that, besides the intrinsic beauty of French fancy silks, there are prejudices in their favor here to be overcome, which it would be difficult to exaggerate. But great as they are or have been, and

however much they may impede the full flow of commerce now opened up, with few exceptions, to the markets of the world by the general repeal of import duties, their influence on purchases cannot be long continued when interest and knowledge are combined to dissipate and expose them.

There are also indications that the classes of goods which seem best to suit the genius of our manufacturers, viz., fancy silks where elaborate design is not required, and plain textures, whether like moirés antiques, satins and glacés, which being comparatively expensive, suit only the wealthy; or small checks, stripes and self-colored Gros de Naples, are likely to meet with an extensive demand for export. Buyers of all nations have already availed themselves of the opportunity of comparison which the present exhibition affords, and texture for texture, and value for value, it cannot be gainsaid that these goods of English production are evener, more free from knots and floss, and generally cheaper than foreign silks of the same nominal character. If all this be true, can the necessary result be other than a question of time?

Class XXI.—Woolen Goods.

The rapid progress and development of this important branch of industry during the eleven years which have elapsed since the exhibition of 1851, present many features of striking interest. The ordinary amount of change and improvement which is looked for in the natural course of things has been outstripped, and the magnitude of the results obtained infinitely surpasses the most sanguine anticipations.

Among the chief features which mark the progress of woolen manufacture since 1851, may be noticed:

1. The increased supply and improvement in quality and variety of foreign and colonial wool, together with the adoption of new combinations of animal and vegetable products for manufacture, and in low goods the extensive use of old or second-hand materials, incorporated with a proportion of new, to give strength and durability to the fabric.

2. The improvement in machinery and mechanical contrivances of every kind, by which results impossible to be attained by hand labor have been realized, great economy in production insured, physical labor lessened, and the productive power multiplied.

3. Improvements in dyeing and the discovery of new and beautiful dyes, the introduction of a great variety of new fancy styles of fabric and texture, together with several new modes of finishing.

4. The steadily increasing dearness of all kinds of raw material, and the regular and progressive cheapening of every kind of manufactured goods, together with the greatly increased and increasing production at most of the principal seats of manufacture.

These important results are traceable to a variety of causes, singly and in combination. Among these causes, international exhibitions, which have been the means of diffusing information among the producing classes, occupy a prominent place; each country having the opportunity of seeing what others were doing, and adopting their improvements. In the struggle for superiority, a generous rivalry has sprung up which has given a great impulse to inventive art and manufacturing skill. Then there has been

the modification or removal of trade restrictions and the opening of new markets and outlets for manufactured goods. Population has also increased, and woolen articles for clothing have come into more general use in all climates, especially for female and children's attire. Besides this, there is the insatiable demand for novelty, and outcry for cheapness, by which a constant pressure is brought to bear upon the manufacturer, urging him to produce variety, and lower his prices in order to meet the competition which everywhere exists, and which is continually increased by the facilities afforded for communication with every quarter of the globe.

Improvements in Dyeing.

Among the most remarkable features connected with dyeing is the comparatively recent discovery and introduction of the universally admired shades of mauve, purple and magenta, as produced from coal-tar.

The improvement in the dyeing of purples deserves to be noticed first. Until 1856, the dyer was dependent for his purples on orchil—sometimes called cudbear—a substance obtained by steeping a particular kind of lichen in putrid urine or a preparation of ammonia. The great objection to the colors obtained from this dye-stuff was their fugitive character. In 1856, M. Marnas, of Lyons, found that by treating the lichens in a different and more elaborate manner, a purple lake was produced which afforded a color better fitted to withstand the action of acids and light. This lake is known as French purple, or orchelline. A good color is also obtained on wool from a liqour made with equal parts of orchelline and oxalic acid.

In the same year, Mr. Perkin discovered his now well-known color, the aniline purple. It is no exaggeration to say that the introduction of this one color has been a greater boon to the dyer than all the other inventions of the last ten years put together. Not only is the hue yielded by the coal-tar purple of a different and better kind than any before known; it is likewise so fast that it may, with indigo blue and a few other colors, be considered as permanent. In the course of the changes of fashion it may be more or less neglected, but must always remain one of the standard dyes.

The substance named aniline was formerly only known to exist in indigo. Its presence in coal-tar was discovered by Dr. Hofmann. Mr. Perkin, a pupil of his, found by accident that, when its sulphate was treated with bichromate of potash, it formed a beautiful purple. The following is Mr. Perkin's own account of the method of preparing his aniline dye: "Solutions of equal portions of sulphate of aniline and bichromate of potash are mixed, and allowed to stand till the reaction is complete. The resulting black precipitate is then thrown on a filter and washed with water until free from sulphate of potash. It is then dried, and the dry products afterwards digested several times with coal-tar naphtha, until all resinous matter is separated, and the naphtha ceases to be colored brown. After this it is repeatedly boiled with alcohol to extract the coloring matter. This alcoholic solution, when distilled, leaves the coloring matter in the bottom of the retort as a beautiful bronze-colored substance. When the sulphate of aniline is treated with other oxidizing agents than bichromate of potash, other colors, ranging from red to blue, are obtained, such as violine and magenta. But none of these are so fast as the aniline purple."

On the discovery of this color it was feared that, however useful to the printer, it would be impossible for the dyer to make use of it, owing to the remarkable affinity existing between animal fiber and the coloring matter. The danger was, that the color would be taken up unevenly by the wool. This difficulty has been easily got over in practice. In dyeing with it, a solution of the purple is made in luke-warm water, the wool is put into it, and the temperature slowly raised to the height preferred by the dyer—for a difference of opinion exists as to the advantage of boiling the wool in this dye. The wool extracts all the coloring matter from the liquor, leaving it almost clear water.

Shoddy, &c.

It has been mentioned that old or second-hand materials are extensively used in the manufacture of the lower classes of woolen goods; these are shoddy, mungo and extract wool. At one time the very name of shoddy was sufficient to excite prejudice, if not disgust; but that time has passed away, the useful properties of shoddy when judiciously applied have long since been recognized, and at present the industry of whole districts depends upon it. Its value and importance, in a commercial point of view, being second only to that of wool, require that it should be noticed in a report on woolen goods.

Shoddy is of three kinds. 1. Shoddy as manufactured from soft woolen rags, as flannels, blankets, stockings, carpets, &c. 2. Mungo, manufactured from hard and fine woolen rags, and new cloth cuttings, &c. 3. Extract wool; that is, wool extracted from mixed cotton and woolen rags by a chemical process, which consumes the cotton, leaving the wool intact.

The two former sorts are held in greatest estimation, as possessing better felting properties. The use of shoddy in the manufacture of woolen goods commenced about fifty years ago; its progress, however, was very slow until within the last twenty years, during which it has assumed gigantic proportions.

There was but limited use for woolen rags prior to this; a few were ground for flocks for paper makers, and some were used for saddlers' stuffing and flock beds, and the remainder thrown on the dunghill to rot for manure. The conversion of woolen rags into shoddy is a very simple process: the rags when sorted are thrown into the machine, the principal part of which is a "swift," revolving within a cylinder; one of these contains ten to twelve thousand iron teeth or spikes, fixed diagonally on the "swift," which is driven at a rate of six to nine hundred revolutions a minute, tearing or rather grinding the cloth, rags, &c., into shoddy. The machines vary a little, but this is the principal process.

Shoddy is mixed with the new wool for manufacturing in the "willying," "teazing" and carding processes, and where a quantity of it is used those machines are prepared accordingly.

The manufacture of shoddy is carried on extensively on the continent, and used there, as here, for the manufacture of low goods; a good deal is also exported to this country. In the exhibition there is a considerable quantity of woolen goods, with more or less admixture of shoddy in them, which the practiced eye and touch alone can detect. They may be seen in

the Yorkshire department; also in those of Belgium, Saxony and most other countries. The valuable addition of cotton warp for cloths only applies to Yorkshire; in this we have a paramount advantage over foreigners.

According to some recent calculations, the annual production of rag wool, or shoddy, in the United Kingdom has been estimated at 40,000,000 pounds; add imported from other countries, 25,000,000 pounds; giving a total of 65,000,000 pounds annually *consumed* in this country in the manufacture of woolen goods, a quantity equal to the net produce of about 250,000 to 260,000 bales of raw wool, or nearly one-half the quantity imported into this country in 1861.

The limited space allotted to this report will not permit entering into any details respecting the various classes of goods in which shoddy is employed. Suffice it to say that with very few exceptions it enters into the composition of all classes of medium and low woolens manufactured in this country and on the continent, and is second only in value and importance to wool itself.

Class XXV.—Printing, etc.

Since 1851 two very remarkable changes have taken place in the machinery for newspaper printing, but neither of these changes can be said to be represented in the present exhibition. The first of these is the extensive introduction into this country of the horizontal four, six, eight and ten cylinder printing presses by Messrs. Hoe & Co., of New York; the second, the application of stereotyping to the rapid, safe and economical production of newspapers having a large circulation.

The printing presses of Messrs. Hoe & Co. had, like Applegath's vertical machines, been invented previous to 1851, and cannot, therefore, be regarded as novelties; but at that date only one had been introduced into Europe, and no sample or even model was exhibited in Hyde Park. There is a small model of the ten cylinder press in this exhibition, but nothing else to illustrate the mechanism by which the principal newspapers of the metropolis and great provincial towns are printed. The first presses sent by Messrs. Hoe & Co. to this country were for "Lloyd's Weekly Newspaper," and were of the six cylinder size. These were followed by two ten cylinder machines ordered by Mr. Walter for the "Times," with the condition that they were to be made by an English machinist who should be approved by him. The "Star" and the "Manchester Examiner" also ordered Hoe presses of English make, and the example thus set was speedily followed by the "Manchester Guardian," the "Daily Telegraph," the "Scotsman," the "Illustrated London News," and in fact all the leading papers in the United Kingdom. The experience, however, of the English made machines had meanwhile (probably from the novelty of the manufacture) not been quite so satisfactory as that of those produced by Messrs. Hoe & Co., and this gave a decided preference to the New York machines, of which not less than thirty-five have been imported since 1856. Mr. Walter still continues to use two of Applegath's eight cylinder vertical machines in printing the "Times" and "Evening Mail," but only as subsidiaries, the chief burden of the work falling on the two ten cylinder Hoe's made by Mr. Whitworth, and these are now said to perform admirably.

They are driven at the rate of thirty-two revolutions per minute, which gives a printing rate of 19,200 per hour, or about 16,000 including stoppages. Much of the ingenuity exercised both in the Applegath and Hoe machines was directed to the chase, which had to hold securely upon its curved face the mass of movable type required to form a page. The complicated contrivances by which this was effected have now been entirely superseded by the use of stereotype plates; but before proceeding to describe the process by which these are obtained, it may be well to draw attention to some of the points which seem to have determined the preference now given to the Hoe presses over the Applegath. The course of the sheet in "laying on" at the Hoe machine is as direct as it can be made, short of printing from a continuous webb, and the taking off is performed with great regularity by means of a wooden frame, which rises and falls with each impression of the printing cylinders. At the Applegath press the direction of the sheet has to be changed from a perpendicular to a lateral motion to correspond with the vertical position of the main drum. A taker-off is also required for each impression cylinder as well as a layer-on, thus considerably increasing the number of hands. The American machine also possesses a decided superiority in the arrangements for securing good register, though the ingenious finger motion by which this result is obtained becomes objectionably rapid in the largest size of presses. The comparison instituted between these celebrated rival machines, and indeed all the foregoing details, have been introduced into this report less as bearing on objects contained in the exhibition than out of deference to the immense importance of the newspaper printing machine in a country governed by public opinion. The same considerations render it incumbent on the reporters to point out that, excellent and surprising as are the results achieved by the Hoe and Applegath machines, they cannot be considered satisfactory while these machines themselves are so complicated, expensive, and liable to stoppages in working. No true mechanic can contrast the immense American ten cylinder-presses of the "Times" with the simple calico-printing machine, without feeling that the latter furnishes the true type to which the mechanism for newspaper printing should as much as possible approximate.

Of the stereotyping process which has been referred to as the second great change effected in the art of newspaper printing since 1851, there exists no example whatever in this exhibition. Yet it is a change hardly inferior to that by which the late Mr. Walter applied steam power to the printing press, and certainly equal to that by which the rotary press superseded the reciprocating action of the flat machine. It was commenced and has been elaborated to its present point by his son, the present Mr. Walter, at the "Times" office. He began his experiments, aided by an ingenious Italian founder, named Dellagana, early in 1856, when, by means of papier-mâché matrixes rapidly dried and placed in a mould, columns were cast in stereotype metal—type high—planed flat, and finished with sufficient speed to get up the duplicate of a form of four pages, which—worked off on a spare flat machine—accelerated the speed at which the "Times" had previously been published by nearly 5000 impressions per hour. The next step taken was to adapt these type-high columns to the Applegath presses,

then worked with polygonal chases. That raised the previous 5000 to 10,000 per hour; but though the publication of the "Times" was thus finished in much less time than before, it soon became clear that the process could be greatly simplified in its details and greatly extended and improved in its application. Accordingly, on the introduction of Hoe's machines, instead of dealing with separate columns, the papier-mâché matrix was taken from the whole page at one operation by roller presses constructed for the purpose. The matrix, rapidly dried on heating surfaces, was then accurately adjusted in a casting machine curved to the exact circumference of the main drum of the printing press, and fitted with a terra-cotta top to secure a casting as nearly as possible of uniform thickness. On pouring stereotype metal into this mould, a curved plate was obtained, which, after undergoing a certain amount of trimming at two machines, specially made for the purpose, could be taken to press and set to work within twenty-five minutes from the time at which the process began. For all practical purposes the printing obtained from these plates was as good as that from pages of movable type. All the risk—and inconvenience—and wear and tear attending the imposition of these pages in curved chases—the placing them on the presses, and subjecting them to the destructive friction of the machining process—were at once obviated. The fount, instead of wearing out every two years, might last for twenty—the plates after doing their work for one day could be melted down the next into a new impression, and (most important of all) the original type page, safe itself from all chance oi injury, could be made to yield any number of copies that might be required by the exigencies of the circulation, and which there were spare machines to work. Thus has it come about that the inner or news sheet of the "Times" is now printed every morning—stoppages included—at the rate of 42,000 impressions per hour—the two American machines yielding 16,000 each, and the one Applegath used, 10,000. Another Applegath remains in reserve, to increase the production if requisite, and to provide against casualties. Between three and five o'clock every morning there are cast and finished in the foundry of the "Times" office, three complete sets of each page of the news sheet—*i. e.*, a triplicate of the eight pages, or twenty-four pages in all; and it will be perceived that if three machines working simultaneously failed to meet the requirements of the circulation, a fourth could be at once added. Mr. Walter has applied steam power to the operations of the foundry, which, though still capable of considerable improvement, are now accomplished with great ease and certainty of result. It is obvious that by the multiplication of stereotype plates and machines there is practically no limit to the number of copies of a newspaper that might be printed within the time which the process now usually occupies.

It is noticeable, that England and the United States are the only countries in which these machines are in use, and no specimen is shown, or mention made, in any other. In the French department it was mentioned to us that the uncertain nature of newspaper property in that country prevented the investment of capital in this direction.

There are several exhibitors of presses for working copper or steel plates, lithographs, &c., both English and foreign, but in these there is no

new principle involved. They are all what are known as rolling presses, and the improvements consist in a little more facility of working, increased power, or larger size; except that Messrs. Maclure, Macdonald and Macgregor (United Kindom) have succeeded in producing very good specimens of work from presses in which steam is the motive power; and other firms are adopting the same means.

EIGHTH REPORT

ON THE

NOXIOUS AND OTHER INSECTS

OF THE

STATE OF NEW YORK.

By ASA FITCH, M. D.,

ENTOMOLOGIST OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

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Executive Committee N. Y. State Agricultural Society:—

In presenting this my Eighth Report upon the Noxious and other Insects of the State, I have it to observe, that, as the preceding year, 1861, furnished a profuse amount of material for my examinations—not only bringing out our customary insects in unusual abundance, but superadding to them such important subjects as the Grain Aphis and the Army Worm—so the present year, 1862, has been a most barren one. On no previous occasion since I have been occupied in these researches, have I been at any loss for suitable subjects for study. It was my design to this year continue and complete my examination of the remaining insects which are detrimental to our grain crops. But, with the exception of the Aphis and the Midge in very limited numbers, our fields of grain were singularly clean and free from insect vermin. That profusion of flies, bugs and leaf-hoppers which we are accustomed to meet with in them, particularly in fields of green wheat, failed this year to make their appearance. Our fruit trees had a similar exemption, even the curculio having vanished from them; and as a consequence, such a crop of fruit was harvested as has seldom before been gathered by the present generation. These remarks apply not only to my own vicinity but to the State generally, although I have become informed of particular localities which were exceptions.

Thus, when the season for being actively engaged in my investigations arrived, I was not a little disconcerted to discover a total want of any interesting material in the fields, the orchards and the forests around me, on which to bestow my attention. The only subjects for study which I was able to meet with in sufficient plenty to favor their investigation were the excrescences or galls upon the oaks and other trees and shrubs. These I had examined and partially reported upon four years ago. And it was now remarkable to observe what a change had taken place in these galls

Some of the kinds, of which four and five years ago I could find scarcely any examples, and was therefore able to give but a meager and imperfect account of them, were now growing upon the trees in abundance, and with them others which were wholly new to me; whilst some kinds which were then most common and which I had studied most fully had now become exceedingly rare or had totally disappeared. I accordingly returned to an examination of these excrescences, and devoted the fore part of the season to them, anticipating that they would perhaps be the only subjects which the year would bring to me, from which to prepare this present Report.

The appearance, however, of the Asparagus Beetle upon Long Island unexpectedly brought to me another subject for investigation, which was of much greater moment and of more immediate consequence than these gall insects of our forest trees; and it seemed to be of paramount importance that this new and surpassingly destructive insect should have its habits and transformations ascertained and that full information respecting it should be promptly communicated to the public. To this subject, therefore, my attention became directed during the latter part of the season. And on coming to make up this Report, as none of our Garden Insects have yet been treated upon in this series of papers, I have thought that some of these which I was prepared to elucidate and on which I had interesting matter to communicate, might most appropriately accompany the Asparagus Beetle—thus making these Garden Insects my leading theme upon this occasion, and deferring the new matter which has been acquired upon Fruit Insects until additional observations will enable me to work it up in a more finished shape than I shall at present be able to give it; although the omission of so considerable a portion of the year's researches will render this Report more curtailed than its predecessors have usually been.

Respectfully submitted.

ASA FITCH.

ASPARAGUS BEETLE. A EUROPEAN INSECT, NEWLY INTRODUCED HERE.

INSECTS INFESTING GARDENS.

1. ASPARAGUS BEETLE, *Crioceris Asparagi*, Linn. (Coleoptera. Criocerida.)

Upon asparagus stalks, throughout the summer, eating irregular roundish spots in the bark; oblong shining blue-black beetles about a quarter of an inch long, with a tawny red fore body and three bright lemon yellow spots on each wing-cover; and with them on the stalks their larvæ, which are soft bodied, thrice as long as thick, thicker posteriorly, of a dull ash gray or obscure olive color, with black heads and legs, of which there are three pairs all placed upon the breast.

Much the most important entomological event in our State the present year (1862) has been the appearance upon the asparagus on Long Island of an insect new to us in this country, and doing great injury to this important crop, threatening even its total destruction. This insect has accordingly been the most prominent subject for investigation which has occurred to me since my last Report was prepared. And I accordingly here present the researches which have been made and the facts obtained respecting it and the vegetation on which it preys—for, as every one will be aware upon a moment's reflection, to enable us to discover the most effectual modes of combating an insect enemy, it is necessary that we know not only the history, habits and lurking places of the insect itself during each of the several states or stages of its life, but that we be also well acquainted with the vegetation which it attacks, its nature, mode of cultivation and all the circumstances attending its germination and growth.

Our garden asparagus, it merits to be observed, is a native of the southern and central countries of Europe, growing wild there, in sandy soils, mostly adjacent to the salt water. The succulent young heads which shoot up from its roots are so tender and palatable as to have rendered it one of the choicest of culinary vegetables and to have brought it into cultivation in gardens from time immemorial. By the writers of ancient Rome, Pliny, Cato and others, it is spoken of and extolled, the same as by writers of the present day.

In its native countries we see three and perhaps more insects are recorded as feeding upon and injuring the asparagus. One of these being quite common is a great pest to the European gardeners. It is called the Asparagus Beetle and in works of science is named *Crioceris Asparagi*. It appears to abound everywhere that the asparagus is cultivated upon the eastern continent, and at times becomes so multiplied in particular districts as to greatly injure or even ruin the plants. Kollar, in his Treatise on Insects injurious to Gardeners and Farmers, places this as the second insect under the head of those which injure gardens.

Plants of the Asparagus kind and forming the group or genus to which the name *Asparagus* is given by botanists, are easily distinguished from other herbaceous plants by their leaves, which are very narrow and thread-like, similar to those of the larch or tamarack tree. Some of these plants are creeping vines, twining around and running over other shrubbery, or sometimes having stiff thorn-like branches whereby they hook to their supports.

ASPARAGUS BEETLE. NO INSECTS ON OUR ASPARAGUS BEFORE.

About twenty-five species of these plants are known to botanists. They are found growing wild in the temperate and tropical regions of the eastern continent, a moiety of them occurring in the neighborhood of the Cape of Good Hope, and the remainder along the shores of the Mediterranean and in the East Indies and Japan.

Being thus numerous and widely distributed in the old world, it is rather remarkable that we have not any plant of this kind, found wild, upon the American continent. And consequently we have no insects here which feed upon vegetation of this nature. Therefore, when the garden asparagus was introduced here from Europe, it was able to grow without molestation from any insect depredator.

There is no doubt that this vegetable was brought to this side of the Atlantic about the time of the first settlement of the country by Europeans. Although we are unable to refer to any record definitely informing us of the time when it was introduced, the fact is fully attested in the documents which have come down to us from that period, that the companies of early emigrants to our shores were unremitting in their efforts to introduce here all the more valuable plants with which they had been acquainted in their native countries—bringing the seeds and roots with them on their emigration hither, or afterwards receiving them from their European friends as opportunities for their transmission presented. We are hereby sufficiently assured that a vegetable so esteemed and so easy of cultivation as is the asparagus, would find its way here immediately upon the first arrival of the settlers. And thus this plant has been growing upon this continent for upwards of two hundred years, wholly free from those insect enemies from which it has all along been suffering in its native regions. It is now in universal cultivation with us. Everywhere through the United States, north and south, there is not a garden of any pretensions, which has not its bed of asparagus, whilst in the vicinity of our largest cities, to supply the demands of their population, whole fields are occupied with it. And yet, although it is growing thus extensively, neither one of those insects which depredate upon it in Europe has ever been found in this country, nor do any of our American insects attack it. Thus it has been our happy lot to grow this one valuable plant, wholly free from the annoyance of seeing it marred and mutilated by those insect foes which give us so much vexation and trouble with almost every other kind of vegetation which we attempt to cultivate.

Alas that our condition, which has been so felicitous in this particular, is now about to terminate—that the worst enemy to this culinary herb has at length found its way to our shores, with every probability that it will multiply and extend itself over our country, to remain as another evil entailed upon our land through all coming time!

It was in June last that a box came to my hands from the President of the Queens County Agricultural Society, Daniel K. Young, Esq., of Matinnecock, containing an insect and its larva, which in an accompanying letter was stated to have newly appeared there upon the asparagus, greatly injuring and threatening to totally ruin this valuable Long Island crop. This insect I at once saw was the noted Asparagus Beetle, so long known and so often complained

of in Europe. An article was thereupon furnished to the Country Gentleman, which appeared in that periodical the following month (vol. xx, p. 32) announcing the presence of this insect in our country, and giving a description of it in the different stages of its life. From the imperfect information which I then possessed, I supposed that, having newly arrived upon our shores, it was probably limited to a small district as yet, and if so, that it might be possible to crush and exterminate it, whereby our country would be released from it, perhaps for a century to come, as it has been for two centu ries past.

It was only by inspecting the insect in the field of its operations that such a full acquaintance with it and the conditions favoring its existence could well be obtained as would enable me to judge of the practicability of subduing it, now, before it becomes more widely spread and more securely established. As one of the most important points remaining to be discovered respecting it was the state and situation in which it secretes itself during the winter season, it was in the month of October, when it had mostly retired into its winter quarters, that I visited Long Island on this business.

In reporting the information which I there obtained I may first allude to the value of this crop upon Long Island, and the amount of loss which this insect is threatening to occasion.

Some of the largest asparagus plantations are at the western extremity of the island. The name of Mr. Backus was mentioned to me as having one hundred acres occupied by this plant. But attention in that vicinity is more directed to other market vegetables, whereby this receives less care and is not grown to so great perfection as at some other localities. The best asparagus is brought to the New York market from different places along the Sound in Queens county. Oyster Bay and Glen Cove in particular are noted for the quality and amount of this vegetable which they export. There are steamboat landings, one near the north-east the other near the north-west corners of the town of Oyster Bay, some thirty miles distant from New York. Between and five miles equi-distant from these two places is the hamlet and post office of Matinnecock, where this plant appears to be cultivated in the greatest perfection—where the premiums on asparagus of late years awarded by the Queens County Agricultural Society have all been taken—and where this insect has the past summer been most destructive. The locality appears to be peculiarly well adapted by nature for the growth of this plant, it being a nearly level tract at the head of one of the arms of Oyster Bay and but moderately elevated above the ocean level, its soil for the most part a deep sand, the cultivated portions of which are kept in a high state of fertility by stable manure brought by water from the city, of which one hundred carman's loads (of fourteen bushels) per acre are customarily applied—this being the dressing given each year to the asparagus beds. The largest and best crops in this place have been grown by Peter Cock, who is now deceased. Full particulars of the crops he has produced may be found in the Transactions of our Society for 1860 and 1861. He has seven acres planted to asparagus, his sales from which amount to two thousand dollars annually, one-half of which is clear profit. And it is in his plantation that the Asparagus

Beetle has been the most destructive. About three acres of his plants were almost ruined, and the loss which he sustained the past summer from this insect was full four hundred dollars. Adjoining Mr. Cock is Daniel Smith, whose crop is also given in our Transactions. He has five acres, and contiguous to him George R. Underhill has a similar amount. Though their crops were badly injured they suffered less than Mr. Cock.

About seventy-five acres in and around Matinnecock are occupied with asparagus; and should this insect continue to multiply and increase the coming year as it did the past it will ruin every plantation in the place.

As is shown by the freight bills of the steamboats, this crop brings to the town of Oyster Bay the sum of $20,000; one-half of which being clear profit, this insect threatens to occasion a loss to this town of ten thousand dollars annually.

At a conversational meeting of the Queens County Agricultural Society, held in connection with its annual meeting, November 4, 1862, and reported in the pamphlet edition of the Society's Transactions, pages 6 and 7, this insect was the principal topic of remark. Though the amount of asparagus grown in other towns than Oyster Bay was not definitely reported, it was there supposed that Flushing, Newtown and Jamaica each equaled Oyster Bay, and that the two remaining towns of the county, North Hempstead and Hempstead, together produced perhaps a similar amount. The annual dead loss which it was thus estimated this insect was threatening to occasion the county was fifty thousand dollars.

At Matinnecock I had the pleasure of forming the acquaintance of Mr. Young, President of the County Society, and was gratified to find he had bestowed such particular attention upon this insect and its habits that he was able to give me exact information upon a number of points respecting which I wished to inquire, and to guide me to the most favorable places for making such personal examinations as I desired. The insect was first noticed at that locality the year before, in July, and it was then seen that it fed upon the asparagus; but there were so very few of them that they excited no apprehensions. This season more were to be seen upon single stalks of the asparagus than were noticed in all the grounds around there the year before.

At the conversational meeting of the County Society above referred to, Mr. John Quin presented a written statement rendering it tolerably certain that at Astoria this insect was first noticed in the year 1859. And I recently learn that specimens of the beetle were found by the entomologist Henry Ulke, somewhere in or around the city of New York, at least as early as the year 1858 or '59. Mr. Young has seen this insect at different points along the north side of Long Island, whereby he knows it is at present spread a distance of at least forty miles, from Williamsburgh to Huntington.

The following facts stated at the conversational meeting above alluded to, will serve to show the ravages of this insect at different localities in Queens County.

At Astoria, Mr. F. Briell first noticed this insect on his beds in 1860. Their depredations were but slight that year, were greatly increased in '61, and this past summer one of his beds was entirely destroyed, the roots being

so much reduced for want of tops to support them that he had it plowed up. Capt. Monson had his beds attacked in 1860, and in 1861 the tops were badly eaten, but for some unknown cause the beetles all left his grounds about the last of August, whereby towards the close of the season a few new shoots sprang up and grew unmolested. The last summer the bark was completely eaten from all his plants and the roots showed such rapid decay that he had them broken up. Mr. Rebone stated that his asparagus beds had been entirely destroyed the past summer.

At Flushing, Mr. King has had them two years in his beds; has tried lime, salt, and a strong solution of potash, to no purpose, and thinks if this beetle is not soon destroyed the asparagus will be. Thomas Duncan, gardener for E. J. Wooley, Esq., thinks he had less of the insect this year than last and attributes this to his having mulched the beds with sea-weed last winter. Edwin Hoyt has had his beds almost destroyed. A new bed planted a year ago was weaker now than it was the first season.

From Newtown a gentleman stated his beds had escaped with the exception of his young seedling plants which were all destroyed.

From these data it appears that this insect was first noticed in Queens county at Astoria, one of the points nearest to the city of New York, where it began to be slightly destructive in the year 1860 and has rapidly increased each year since and has spread itself over nearly all of the county. It would seem to have advanced at the rate of some twenty miles a year, although our information upon this point is by no means precise.

Over the State of New York generally, at least over all its northern section, we are accustomed to see the asparagus only in gardens, where the roots have been planted by the hand of man. In only a solitary instance many years ago I met with a small stalk of this plant in my own vicinity, abroad in the fields, growing spontaneously from the seed. Where it is thus restricted exclusively to the gardens it would be no formidable task to keep all the shoots from the roots cut down a sufficient length of time to cause any insect which subsisted upon them, to perish for lack of food. But upon Long Island the circumstances I find are wholly different. There the asparagus plant is perfectly naturalized, growing readily from the seeds, which are everywhere scattered, chiefly by the crows which feed upon the berries the latter part of winter when their other supplies of food have become exhausted. Hereby slender, spindling stalks of this plant may be seen growing in all situations—by the roadsides, in the fields, and in the woods. Thus the Asparagus Beetle has such an abundance of food everywhere presented to it, and the insect is already occupying such an extent of territory that there seems to be no mode by which it is now possible for us to effect its extermination.

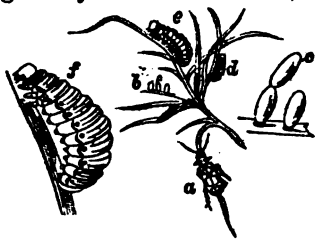
One of the points of most importance to complete the history of this insect—a point upon which I was able to find no information in any foreign author in my hands—was to ascertain its hybernation or the situation in which it secretes itself to pass the winter season. Three of the larvæ which had been sent alive to me in June, forsook the asparagus when they had completed their growth. I hence supposed it was most probable that they entered the earth to repose during their pupa state; and that the last larvæ which descend

ASPARAGUS BEETLE. WINTER QUARTERS OF THE INSECT. IT COMES OUT IN MAY.

from the asparagus at the close of the season, remain in the earth during the winter and produce the beetles which come abroad in May. To ferret out the winter quarters of the insect, therefore, my first step was to examine the earth in a place where these insects had been most numerous and destructive. But neither in contact with the underground portion of the stalks nor in the soil surrounding those stalks were any pupæ to be found or any traces indicating that the soil had been mined and penetrated by these insects. Though disappointed and scarcely knowing where to look next, it was certain that the insect, either in its larva, its pupa or its perfect state, was concealed somewhere about these asparagus beds in such numbers that its lurking place could surely be discovered. Upon inquiring the circumstances under which the insects had vanished, I was informed that the beetles had remained upon the asparagus without any apparent diminution of their numbers, until the first frosty night of autumn, when they suddenly and almost totally disappeared. A very few stragglers only were the latter part of October still remaining out upon the stalks on warm pleasant days; and observing them in this situation, it occurred to me that if a cold wind were to arise it would so chill and benumb them that they would drop to the ground, where they would crawl under any rubbish, such as fallen leaves and fragments of straw and dead weeds, which they could there meet with, and thus concealed, they would remain torpid through the winter and revive and come abroad again with the warmth of the following spring. Search was thereupon made under the small masses of haulm which were lying on the surface of the asparagus beds, but only occasionally could one of the beetles be met with in this situation, rendering it evident that this was not the retreat to which their legions had withdrawn for the winter. Turning next to examine a contiguous fence to see if this could furnish any lurking place for them, upon raising a splinter from one of the rails a view was obtained which it was wonderful to behold. The crevice under this sliver, a foot or more in length, was occupied by a throng of these beetles, crowded and compacted as closely together as it was possible for them to stow themselves. And on looking further, it was found that under the coarse lichens and moss growing upon some of the rails, under the dry bark adhering to others, under the loose scales of bark upon the trunks of trees, under the clapboards of buildings, in short, wherever a crack or crevice, so situated as to shed the rain, occurred around these asparagus plantations, it was filled and thronged with these beetles. They were lying torpid and motionless in these retreats, sunk in their winter's slumbers, although the weather was still mild and warm, nor did they awaken to activity even when uncovered and exposed to the rays of the sun.

Early in May, soon after the season for cutting the asparagus for market has begun, these beetles come forth from their winter quarters and commence feeding upon it, gnawing and marring it, and scattering their eggs upon it. The eggs, represented in the annexed cut at *b* and magnified at *c*, are of a blackish brown color and of an oval-oblong shape, like a grain of wheat, though not an eighth as large. They are attached to any part of the young plants, but after these have grown up to stalks the eggs are for the most part placed upon the leaves and near the end of the slender branches

which are no thicker than a coarse bristle—situations where they will be least liable to be disturbed by the beetles or larvæ in feeding. They are glued by one end to the leaf, and so firmly that the end appears as though it were embedded in the leaf. They thus stand erect, in a row, about as far distant from each other as their lengths, each row containing about five eggs, but the number varying in different instances from two to six or seven. Mr. Westwood, whose figures of this insect we have copied in the above cut (Modern Classification of Insects, vol. i, p. 372, fig. 16 and 18) represents two of these eggs, placed, one elevated upon the top of the other. His figuring them thus, is an ample assurance of the fact that they do sometimes occur, placed in this manner. But it must be exceedingly rare. Mr. Youngs informs me, that since seeing this figure, he has looked particularly to find an instance of this kind, but without success.



ASPARAGUS BEETLE, ITS EGGS AND LARVA.

The eggs hatch in eight days, and the larva (represented in the cut, when young at *d*, when full grown at *e* and magnified at *f*) is from ten to twelve days in getting its growth. It attains a length of about a quarter of an inch. It is of an obscure olive or dull ash gray color, often with a blackish stripe along the middle of the back. It is soft and of a flesh-like consistency, about three times as long as thick, thickest back of the middle, with the body much wrinkled transversely. The head is black and shining, and the neck, which is thicker than the head, has two shining black spots above. Three pairs of legs are placed anteriorly, upon the breast, and are of the same shining black color with the head. As will be seen when it is crawling, the larva clings also with the tip end of its body; and all along its under side may then be seen two rows of small tubercles, slightly projecting from the surface, which serve as pro-legs in addition to the tip of its body. Above these tubercles on each side is a row of elevated shining dots like warts, above which the breathing pores appear like a row of minute black dots.

Like the perfect insect, the larva feeds upon the asparagus only, eating holes through the outer bark of the plant, and preferring the tender bark on the ends of the stalks and on the branches, to the more tough and stringy bark towards the base of the stem. It moves very slowly, and is shy and timorous. As you approach it, it stops eating and holding its head stiffly back it emits a drop of black fluid from its mouth. This appears to be its only defence against being devoured by birds and other predaceous animals, the acrid taste of this fluid probably rendering the larva unpalatable to them. It also clings tenaciously to the asparagus. Before tying the cuttings up in bunches for the market, they are thoroughly washed, by being held usually under a pump; but these worms cling so tightly that only a part of them are washed off, and this black fluid from their mouths stains and nasties the hands of the men, in bunching the cuttings, it being as sticky as molasses.

When they were done feeding, the three larvæ which came under my observation in June, left the plants. I therefore inferred that they entered the

earth to repose during their pupa state. But it may be that they merely crawl under any mass of dead leaves and bits of straws which they find lying on the surface of the ground. This is rendered probable by Mr. Young's observations. He put several of the larvæ into a tumbler, with netting tied over it to prevent their escape, supplying them with fresh asparagus from time to time. They finally went down to the bottom of the tumbler and disappeared under the mass of dry withered leaves and branches which had accumulated there. Upon raising this mass from the tumbler, the insects were found to be inclosed in slight cocoons which they had spun, and which adhered to the under side of the rubbish when it was elevated. As some of these completed their transformations, it shows that it is not essential for them to enter the ground to pass their pupa state.

In about thirty days from the time the egg is laid the insect grows to maturity and comes out in its perfect form, when it appears as represented in the foregoing cut at *a*. The time will be shorter, no doubt, in the hottest part of the season in July and August, than in the cooler days of May and June. How long it lives, to be eating the asparagus, after it attains its perfect form, is not known. One of the beetles, fed in confinement, lived a fortnight, but how long it had been hatched from its pupa before it was imprisoned was not known. The females probably live much longer than the males, this being the case with insects generally. As it occurs to notice upon the asparagus, the two sexes are usually seen paired. They feed upon the bark, eating irregular oval or oblong holes through it, lengthwise of the stalks, and varying in size from about an eighth to a quarter of an inch in length. These holes are most numerous towards the top of the stalks and on the branches, where, frequently, nearly the whole of the bark is consumed. The beetles are very shy and timorous, whereby we are never able to see them in the act of eating. As you approach, the guilty culprit always slips around to the opposite side of the stalk, to hide himself from being noticed. And if the stalk is taken hold of to turn him around into view he drops to the ground and pretends to be dead, lying perfectly still. You think he is now playing off his last dodge upon you, and that you have finally got him where you can turn him over and deliberately inspect him before you crush him. But these thoughts only have time to flash across your mind before the creature takes wing and flies away so suddenly that ere you are aware of it he is gone out of your reach.

In its perfect state the Asparagus Beetle is a beautiful insect, of an oblong form, its length very slightly exceeding twice its width. It measures a little less than a quarter of an inch, its average length being 0.22, but different individuals vary somewhat in their size. It is highly polished and shining, of a blue-black color, frequently with a tinge of green. The head and thorax are narrower than the hind body, and have numerous punctures. The head shows a furrow on its middle, above the insertion of the antennæ. The antennæ reach the base of the wing-covers, and are coarse, thread-like, with the three joints following the basal one somewhat smaller and shining, the remaining joints being opake and brownish black. The thorax is slightly convex and bright tawny red. Frequently a discolored cloud appears in its center, which in many individuals becomes darker, forming two black spots, and these spots are sometimes more or less united. The wing-covers are coarsely punctured in rows. They are broadly bordered on their outer sides with orange yellow, which color is widened at the tips, where, on the edge of the suture, is a slender blue-black line. Along the middle of each wing-cover is a row of three lumps

yellow spots. The anterior one of these spots is placed upon the base of the wing-cover, and is usually egg-shaped with its pointed end directed backward. In perhaps a majority of instances this spot is prolonged and is confluent with the inner anterior angle of the middle spot. The middle spot is placed at a third of the distance from the base to the tip of the wing-cover. It is transverse, being a third more broad than long, and is thicker towards its inner end, which terminates at the third row of punctures from the suture, its opposite or outer end being confluent with the orange border. The hind spot is placed nearer to the middle spot than to the widened orange tip of the wing-cover. It is similar in most respects to the middle spot, but is frequently smaller and placed somewhat obliquely, its inner end inclining backward, and its outer end uniting with the orange border by a narrow neck. But these three spots are much varied in their size and form in different individuals, and are sometimes white instead of yellow. The under side and legs are shining blue-black, and there is frequently a dull yellowish band below the knees and a spot of the same color on the base of the hind thighs.

We finally come to remark upon the remedies for this insect.

Being aware that the Asparagus Beetle has been known in Europe for centuries, we naturally look to the long experience they have there had with it, to furnish us with some convenient and efficacious mode of combating and subduing it. But we look in vain. As the result of the efforts and observations of the gardeners there, we are told there is one remedy which is effectual, and one only. It is given to us in a single line of Kollar's Treatise, as in other publications, that "the only means of destroying these insects, is, picking off and killing the beetles and larvæ."

Now this remedy of picking off the insects by hand and killing them, will suffice very well, we doubt not, for ordinary cases, where it is only a common sized bed in a family garden which requires attention. But where whole acres are overrun, and every plant thereon thronged with these insects, we see how vain it is to mention such a remedy as hand-picking, as being a suitable resort against such myriads. We should almost require to recall the million of men we have sent out to the war, and marshal them in these Long Island asparagus plantations, in order to succeed in cleansing them of these vermin by this process. The crops there must be hopelessly abandoned to their fate unless some more practicable remedy than this can be discovered.

In the middle of one of the asparagus fields we noticed the dry dung of some animal as being wholly composed of the prettily spotted wing-covers and shining fragments of the legs and other hard parts of these insects, showing that the animal had been feeding upon and had consumed an immense number of them. The animal which had been glutting itself in this manner was undoubtedly the skunk (*Mephitis Americana*) whose relish for insects, when it can obtain them in sufficient quantity to supply its wants, is well known. And it might hence be made a most valuable auxiliary in destroying this Asparagus Beetle—but unfortunately we cannot recommend the protection, even for this important purpose, of a creature which is everywhere in such *bad odor*.

But the query then occurred to us, if this tabooed animal has such an appetite for these insects, have we not in our country some other animal which will have a similar relish for them? This suggested an experiment to us, the result of which we hastened to ascertain. A large sliver upon which a multitude of these beetles were crowded together in their winter's sleep, was broken from a rail and taken to the poultry yard and a few handfuls of corn were

GARDEN FLEA. MOST ABUNDANT, BUT HITHERTO NEVER NOTICED.

scattered around, to attract the fowls to it. It was interesting to observe their gradual approach in eating the corn, until one of their number happened to perceive these insects. Instantly thereupon she hurried to picking them up, and in a moment, the whole flock, abandoning the corn, was crowded to this spot, each on the alert to obtain a portion of the dainty fare. It amply demonstrated how highly they relished these insects.

Although fowls are prone to pick and injure cabbages, cucumbers, and several other garden vegetables, experienced cultivators of the asparagus assure me they never molest this plant. We are therefore to look to them, I think, as being our best protectors against these insects. At the conversational meeting of the Queens County Agricultural Society above alluded to, two instances were related, in which a portion of a bed to which chickens had had free access, had not been injured. If a flock of fowls is placed in an asparagus plantation, they will probably range over the grounds, continuing to forage upon these insects so long as one of them can be found. There is the fairest prospect, therefore, that they will prove to be a most efficacious protection, and that by them our Long Island market gardeners will be able to rescue their valuable asparagus crops from the ruin with which they are at present threatened.

2. GARDEN FLEA, *Symnthurus hortensis*, new species. (Aptera. Podurida)

Superabundant in gardens in May and June, upon the leaves of young cabbage, turnip, cucumber, and various other plants, and also on the ground, soft black wingless insects smaller than grains of gunpowder, and skipping with agility.

It is fifteen years since, that in an article on "Winter Insects" in Dr. Emmons's Quarterly Journal of Agriculture and Science, I named and described the Snow Flea, *Podura nivicola*, a minute insect which appears like grains of gunpowder sprinkled over the surface of the snow upon warm days in the winter and the opening of spring. An insect closely related to this appears every year in our gardens during the fore part of the season, so numerous that it attracts the observation of every one at work therein, and is universally regarded as injurious. No account of it, however, is to be met with in any of our popular treatises upon gardening. I have always supposed it to be this insect, of which Dr. Harris speaks from memory, in the following paragraph in the First Edition of his Treatise, page 125, but which is omitted in the subsequent edition—and if so, this is the only published allusion to this insect, which, to my knowledge, has ever yet appeared in our country.

"Several years ago I observed that cucumber vines were much infested by some minute jumping insects, rather less than one-tenth of an inch long, of a broad oval shape, and black color, without wing-covers, but furnished with short thick hinder thighs. They injured the vines very much by eating holes into or puncturing the leaves, and were expelled by dusting the plants with flour of sulphur. These cucumber-skippers were so soft and tender, and withal so agile, that it was difficult to catch without crushing them. Consequently I was unable to examine them thoroughly, and failed to preserve specimens of them. It is possible that they may

come near the genus *Myrmecophila* (Order ORTHOPTERA, Family ACHETIDÆ) which was unknown to me at this time; and since then these minute insects have escaped my observation. They were very different from the little flea-beetles, *Haltica pubescens*, also found on cucumber vines."

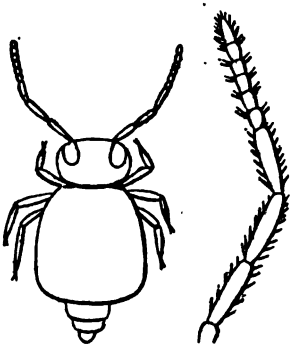
This is a wingless insect, most nearly related to the Lepisma or Spring-tail, and like it skipping by means of a forked tail which is held against the under side of the body. It thus pertains to the Apterous order of insects, and to the family PODURIDÆ, which, with the Lepisma constitutes the group or sub-order named THYSANOURA. This group is arranged in scientific works next to that which embraces the flea (*Pulex*); and this name, flea, is frequently given to the species of the family Poduridæ also, and appears to be the most appropriate term which our language furnishes by which to designate these insects. By some of the gardeners around Albany I have heard the species now under consideration called the "Little sand flea," its size being so similar to that of a particle of sand. But as this name will be apt to give the erroneous idea that the insect abounds in sandy soils more than elsewhere, I regard the name Garden Flea as its most suitable designation; and it has for a long time been entered in my manuscripts under the corresponding technical name *Symnthurus hortensis*.

This insect is abundant in our gardens when we first commence work in them in the spring, though it is not till the young plants have come up from their seeds and the first weeding among them takes place that it usually attracts our observation. Numbers of them are then noticed to be standing in the warm sunshine, upon every leaf, every pebble and fragment of a dry weed which projects above the surface of the ground. Some of them are seen to be moving about, but with feet so minute that they are invisible. And if the finger is approached towards those which are standing upon a particular leaf, one after another deliberately throws itself with a sudden skip to the ground, till all have disappeared. They, however, are not shy and timorous, but gentle and disposed to be familiar; for, as they are everywhere skipping about in the dirt, if the hand happens to rest upon the ground a few moments, one or more of them is observed to have alighted upon it, and continues to stand thereon as if without any alarm or consciousness of danger. And thus they continue in the garden till in the latter part of June they become much less numerous and gradually cease to be noticed. As we look at them when they are standing in the strong sunlight, all that the eye is able to discern of them, is, that they are extremely small dull black objects, scarcely half the size of a mustard seed, that "smallest of all seeds," and that they have an egg-shaped form, moving with their smaller end in advance. Some of them it is noticed are smaller than the others, and the smallest ones are perceived to be of a paler or dull brown color.

When looked at through a magnifying glass, we first notice a remarkable difference in the structure of this Garden Flea from that of insects generally, it being composed of only two principal parts, a head and a body, this latter being formed of the thorax and abdomen consolidated together into a single piece the same as in the higher classes of animals,

GARDEN FLEA. THE FORKED TAIL AND SKIPPING APPARATUS.

the three pairs of legs being inserted upon the fore part of its under side.



As it is viewed from above the body has a somewhat square outline, but is broadest posteriorly. The four sides of the square are convex, with rounded angles, the rotundity increasing as it is more distended with food, and becoming globular when surfeited. It is plump and smooth, without any visible indications of transverse impressed lines or sutures dividing it into rings; but, jutting abruptly out from the middle of its hind side is a large teat-like protuberance forming the end of the body, and this is perceptibly composed of three segments, as is represented in the annexed figure. On its under side, however, the body is uneven and transversely wrinkled, here showing four segments more or less distinctly. And on its under side is also noticed the curious apparatus, the forked tail, wherewith these Garden Fleas possess the faculty of skipping. Two soft flesh-like threads are plainly perceptible, of a dull white color, and slightly diverging from each other, held against the breast with their ends reaching forward nearly or quite to the mouth. They seem to arise from the center of the under side of the body, but in reality are inserted into the end of a single stalk which it is more difficult to distinguish and which originates farther back toward the hind end. Thus this tail-like appendage is similar in its structure to a common table fork, of which the handle corresponds with the stalk or basal portion, and the tines with the two threads. These threads gradually taper towards their ends and are bearded with minute hairs, their tip being formed of a small oblong joint which is destitute of hairiness. On the fore part of the breast, bulging out between the two threads may be observed a slight protuberance or button-like elevation, looking much as though the insect had a tumor upon its neck analogous to the disease termed *goitre* by physicians. And it appears to be in a groove upon each side of this protuberance that the inner sides of the threads are pressed when the insect is about to make a skip. Then, in an effort to extend the tail out from the body, the threads slipping suddenly from the grooves strike against the surface on which the insect is standing, so forcibly as to throw it a distance of several inches.

The head is separated from the body by a deep constriction, leaving only a small neck connecting these two parts. It is about a third narrower than the broadest part of the body, more broad than long and of a flattened globular form. The antennæ are inserted upon the front, wide apart from each other at their origin, and are held obliquely forward and outward, each moment touching the surface over which the flea is walking, as if they were examining the nature of the pathway before it. These organs, represented greatly magnified on the right of the above cut, are thread-like, four-jointed, and elbowed in their middle between the second and third joints. The three first joints are cylindrical and of equal length. The fourth joint is longer and compound, being formed of six small joints,

which are a third longer than thick, each one increasing slightly in thickness towards its tip, except the apical one which has the form of an elongated egg and is longer than those which precede it. The antennæ are bearded with fine, short hairs, as is also the front, the hind part of the body and the legs.

Its color, in the largest individuals, is dull black, without any glossiness, the head being dull yellowish brown or rust-colored, with the eyes black and the edges of their orbits whitish. The antennæ are also dull black with their bases rusty, and the legs are of this last color. This rusty color varies in its tone, being sometimes bright and clear, and at other times or in individuals from other situations, dull and obscure.

From differences in their color and size we might readily name and define four or five species from what I do not doubt are merely the different stages of one species in its progress from youth to maturity and old age. The following varieties are the most important, and are so marked and of such frequent occurrence that they merit to be noticed.

1, *juvenilis*, or the Young Garden Flea. Yellowish brown or rust-colored throughout, the body being of the same hue with the head; and but half the size of the largest individuals. These are most common at the opening of the season.

2, *basalis*. Body dull black, its anterior part and tip rust-color.

3, *dorsalis*. Body dull black, its tip and a stripe along the middle of its fore part rust-color.

4, *apicalis*. Body dull black with only the contracted apical protuberance or tip rust color. Common.

5, *maturus*. Body dull black throughout, the head, legs and bases of the antennæ rust-color. This appears to be the normal state of the mature insect.

This insect is not limited to the garden, but occurs more or less common everywhere in arable land. In fields of young wheat and rye, in May and June, I have often noticed it as being more numerous than any other insect there. And in fields of clover I have sometimes found it in great numbers, in company with the yellow Field Flea next to be noticed.

It is so very abundant in this country that we should expect it would be common in Europe also. But none of the species of *Symnthurus* described in Nicolet's article (Noveaux Memoires de la Societe Helvetique, vol. vi, p. 81) in Gervais (Apteres—Suites a Buffon) or any other author which I have at hand, appear to coincide with our insect. If it occurred in England as it does here, we think it could not have been overlooked by Mr. Curtis, in his late researches. But in his invaluable volume on Farm Insects, recently published, we only meet with one species of this genus, described (p. 432) as occurring on the under side of potato leaves in July and August, which is evidently unlike this insect of our country; though in the same connection he makes the following remark, which very probably refers to the species of which I am here speaking. He says: "In Nova Scotia the crops of turnips

GARDEN FLEA. ITS FOOD, AND COMBATS. HOW IT INJURES THE LEAVES.

and cabbages are principally destroyed, whilst in the seed-leaf, by some *Symnthurus*, the size of a pin's head, and nearly globular. It hops with great facility by means of its forked tail, and may be found on every square inch of all old cultivated ground, but it is not plentiful on new land."

These Garden Fleas are so minute that the human eye without the aid of glasses is wholly unable to inspect their movements. The following observations will therefore be the more interesting to the reader. It is some years since, that I noticed several of these insects on a piece of new pine board lying in the garden. Wondering what they could find to attract them to that situation, where I thought the odor of any turpentine in the wood would rather make it repulsive to them, I was able to observe their operations by approaching a magnifying glass to them gently, so as not to alarm them and cause them to skip away—the light colored surface of the new wood enabling me to inspect their movements much more accurately than could be done were they standing upon a darker colored ground. Several of them were noticed, here and there, to have, grasped in their mouths, what appeared to be an exceedingly minute flexible fiber of the wood, fine as a fragment of a spider's web; and they were pulling backward, at the same time shaking their heads slightly, evidently to tear off these fibers. One of the fore legs was frequently used to crowd this fiber more and more into the mouth, whenever it became peeled up and too long to pull upon to advantage. Everything indicated that it was for the purpose of food that they were thus tearing off this fine fuzz from the surface of the new board. At one place was a small black spot in the board, caused apparently by some old disease in the wood at this point, which rendered it more soft and palatable to the insects, for two of them were here busily occupied in gnawing the particles of matter from the surface, as it seemed. And this brought them so close together that one of them happened to jostle against the other. This indignity was promptly resented by the flea which was thus intruded upon, who resolutely put his forehead against that of his comrade and pushed him back, in a similar manner to two cows fighting. A combat hereupon took place between them, each endeavoring to bite the head or legs of the other. This fighting lasted only a moment or two, however, and then both quietly returned to the discolored spot and again commenced gnawing the friable matter there. Ere long the same mishap again occurred and the same combat was again repeated and their differences adjusted as speedily as before.

Our gardeners universally regard these fleas as being injurious, but not so severely injurious as the larger sized flea-beetles (*Haltica*) with which they are almost always associated. And this appears to be a correct estimate of their character. I have sought to ascertain the exact nature of the injury which they do, and from the best observations which I have yet been able to make I think these fleas never perforate holes in the leaves or gnaw their texture where it is green and in a healthy, growing state. Their small jaws are probably too soft and weak to enable them to break down and masticate the substance of the leaf. But when a flea-beetle perforates a hole in a leaf, these garden fleas afterwards gather around the perforation to feed upon the soft matter which is there formed by the evaporation of the exuding juice.

This matter makes a kind of scab upon the raw surface of the wound, covering it and enabling it to heal. These garden fleas feed upon this scab, thus tearing open the healing wound and causing it to bleed afresh. Hereby the holes in the leaf become much larger than when they are first made by the flea-beetle, and nature is interfered with and embarrassed in her efforts to recover from the injuries done by the flea-beetles and other insects which wound the leaves. It is chiefly in this manner, I think, that these little garden fleas are detrimental to the plants on which they occur.

Dusting the infested plants with ashes, sulphur, etc., and most of the other remedies which we resort to for expelling the flea-beetles from them, are still more efficacious in driving off these garden fleas also. These remedies will be more fully treated upon when we come to speak of the flea-beetles, as they are insects which it is more important to combat.

3. FIELD FLEA, *Symnthurus arvalis*, new species. (Aptera. Poduridæ.)

In May and June, scattered upon the leaves of the pie rhubarb and other garden plants, on fruit trees in the orchard, and abundant in fields of clover; a minute soft yellow wingless insect, skipping feebly.

This species is scarcely half the size of the foregoing one, usually measuring only 0.02 in length. It is of a pale yellow color, commonly tarnished or dull yellow, sometimes with a tinge of green, and its head, underside and legs whitish. A dusky cloud is frequently seen in the middle of the body. It is of an egg-shaped form, almost globular, with the extremity of its body protruded as in the Garden Flea, its outline thus having a projecting angle on each side forward of the tip. The antennæ are thread-like, elbowed, and as long as the body. They are composed of three joints only, the last one being compound or made up of ten small joints similar to those of the last joint in the Garden Flea, and forming all that portion of the antenna which is beyond the elbow.

In a field of clover, on sweeping over the leaves, the net gathered myriads of these insects, so late as the last of June, at which time small young ones were greatly in excess of those which were full sized, indicating that they continue much later in the season than I have ever noticed them. Upon beating the leaves of apple trees in May and June, several of these insects will frequently be found in the net. And it is common to see them in the garden, upon the leaves, particularly of the pie rhubarb, *Rheum Rhaponticum*, where these leaves are perforated with holes by the flea-beetles.

On one occasion, when I was endeavoring to inspect the motions and operations of these insects with a magnifying glass, I saw two of them approaching each other as though they intended to bunt their heads together. Though I could not observe their motions so accurately as to be certain of the fact, it appeared as though, just as their heads were coming together, the smaller one with his antennæ grasped the sides of the head of the larger one, to break the force of the blow and prevent himself from being knocked over by his more powerful antagonist. Instantly thereupon, as though to break off the smaller one from his grasp, the larger

one commenced whirling, swinging the smaller one around and around as we sometimes see a man in play grasp a child under its armpits and whirl around with it. As if to prevent himself from becoming dizzy, the larger one after a few revolutions reversed his motion, whirling now in the opposite direction, and after a short time returned again to the direction he first had. The two then became separated, and stood facing each other for a time, the larger one ever and anon advancing slightly, as if about to bunt against the small one, which receded at the same moment, and then advanced again as the larger one drew back. At length the larger one seemed to get hold of the palpi or mouth of the smaller one, pinching it for a moment, and then walked away, the smaller one appearing for the instant to be semi-paralyzed with pain, recovering from which, it also walked off as though nothing had happened.

After the full account which has been given of the Garden Flea, it will not be necessary for me to speak further of this species which so frequently occurs in company with it and has the same general habits.

Several other species of this genus are known to me, but I am not at present prepared to describe them so fully and point out their distinctive characters so plainly, I fear, as will enable other persons to clearly identify them. The three following, however, are so strongly marked that a brief description will probably enable them to be readily recognized.

4. The New York Ground-flea, *Symnthurus Novæboracensis*, is 0.08 long, and of a dull brownish yellow color throughout, its head and legs slightly paler than the body, its eyes only being black. The body is but little broader than the head, oval, slightly attenuated at its tip, with an impressed transverse line conspicuously separating the apex from the body. The antennæ are nearly the length of the body, long and slender, thread-like, elbowed in the middle, with but a single joint preceding the elbow, the remaining length being obscurely divided into (three?) joints.

Several specimens, small and large, occurred under a board lying in a pasture field, in the month of November.

5. The Pretty Ground-flea, *Symnthurus elegans*, is 0.02 long, of a very pale yellow color, almost white, with a pale brown stripe along the middle of its back, and a wider black one upon each side of it, these stripes being common to the head and body. A still wider black stripe along each side of the body. Antennæ dusky, their basal portion pale. The body is globular, without any projection at its tip, and is a third broader than the head, which is also globular. The black stripes upon the back are often somewhat interrupted, or have a curdled appearance as if composed of a number of confluent black spots and clouds of different sizes.

Variety *a*. The middle stripe upon the head black instead of pale brown.

Variety *b*. The middle stripe wholly obliterated and wanting.

The history of the specimens from which the above description was drawn is briefly as follows: Some diseased wheat straws sent to me from Virginia

MODERN VAPORER MOTH. DIFFERS FROM THE EUROPEAN SPECIES.

several years since were placed in a glass jar with moist earth in its bottom. Early in May a number of these ground-fleas made their appearance in the jar. And as I have never met with this species except in that instance, I infer that it was bred from eggs in the Virginia straw and not from the New York earth in the jar, and that it is therefore a Southern insect. Can it be the juvenile state of the following?

6. The MARKED GROUND-FLEA, *Symnthurus signifer*, is about 0.03 in length, black, with two short pale yellow stripes upon the head, the underside and legs dull white. Antennæ three-fourths the length of the body, black, their bases pale yellowish. The body is longer than broad, almost globular, without any projection at its tip, and about twice as broad as the head.

Several specimens of this occurred in company with the preceding.

7. MODERN VAPORER MOTH, *Orgyia nova*, new species. (Lepidoptera. Arctiidæ.)

Eating large notches in the leaves of roses, of plum, apple and other trees, in June; a small pretty caterpillar of a whitish color with a black head and back, and five pencils of long black hair, orange spots on its sides, and along its back four straw-colored tufts and two small bright red protuberances; spinning a cocoon which in July gives out a rusty yellow moth about 1.20 in width, its fore wings largely clouded with dark brown and having a snow-white crescent near their inner hind angle; the female pale gray and without wings.

In my Second Report I gave an account of our Common American Vaporer Moth, *Orgyia leucostigma*. I have since traced out the history of another species, which is closely like the European *Orgyia antiqua*, and is entered under this name by Dr. Harris in his Treatise on Injurious Insects. Our moth, however, differs from that of Europe, as I find on comparing it with very nice specimens of the *antiqua*, which I owe to the kindness of my friend, Dr. Sichel, of Paris, and the colored figures and descriptions of that species given by different authors, in having its fore wings much more extensively clouded with brown. And in its larva state it differs still more decidedly, in having towards the hind part of its back two small projecting vesicles of a bright red color, smooth and shining like sealing-wax. On referring to figures of the caterpillar of the *antiqua* which I meet with in Westwood's Introduction, in Westwood and Humphrey's British Moths, and the still more exact and beautiful illustrations in the "Iconographie et Hist. Nat. des Chenilles" of Duponchel and Guénée, (vol. ii, pl. vi, fig. *a* and *c*) I find these vesicles are not represented as pertaining to that species, nor do the descriptions of these and other authors make any allusion to them; whilst the work last cited distinctly figures similar vesicles as occurring in *Orgyia fascelina* (pl. xi, fig. *a*, *b*,) and particularly notices them in the accompanying text. We thus feel fully assured that these vesicles do not occur in the caterpillar of the *antiqua*, whilst in our American caterpillars they are constantly present, and are one of the characters which first strike the eye of the observer. The chrysalis also differs from the European species in its colors and pubescence, in both sexes, as we shall subsequently have occasion to notice.

Linnæus named the European species *antiqua* or the Ancient, it having been observed and known a long time before. Now that we find our insect to

be different from that, it may, in contradistinction thereto, appropriately be termed the New or Modern Vaporer Moth.

The caterpillars of this moth begin to be seen on rose bushes and plum trees the fore part of June, when they are quite small. They eat large irregular notches in the sides of the leaves, sometimes consuming them so that little more than the midvein is left. A medium sized leaf of the plum tree suffices to feed one of these caterpillars but twenty-four hours. They prefer leaves of the Natural Order ROSACEÆ, but feed readily upon various other leaves also. They are very similar to the caterpillars of our Common Vaporer Moth, but differ in having the head black instead of red, and they also have an additional pair of pencils of black hairs, which are placed on each side of the body forward of the middle.

When young these caterpillars are black with two orange yellow spots, placed, one back of the neck, the other beyond the middle of the body. They lose these spots and become brighter colored as they increase in size, their marks changing more or less with each change of their skins. The following is a description of their larvæ at different stages of their growth:

The YOUNG CATERPILLARS, less than half an inch long, are black and thinly clothed with long black hairs which radiate from warts symmetrically placed, those low down on each side giving out white hairs. The head is black, smooth and shining. The neck is white on its anterior edge, and on each side is a large wart-like spot of an orange color, giving out a cluster of black hairs with little feathery knobs on their ends, which hairs are held together in a pencil. The third and fourth segments have a large orange spot upon their back with a black line along its middle. The four following segments have each a dense tuft or brush of short hairs, on the back, the two first brushes being black and the other two gray. The top of the ninth segment is occupied by a large orange spot, shaded into white along its middle. Following this are two small shining vesicles of a bright vermilion red color, protruding from the middle of the back of the tenth and eleventh segments. On the twelfth segment is a tuft of black hairs similar to those on the fore part of the back. On each side of the body are two white stripes, the upper one slender and much interrupted, and between these stripes is a row of large oval dull orange spots. The underside is dull greenish white, and the legs pale yellow.

Upon changing its skin it becomes half an inch long and wholly loses the two bright orange spots upon its back. Its skin is now black upon the fore part of the body and of a dusky gray color posteriorly. Five pencils of black hairs having their ends enlarged into little heads now appear, placed, one upon each side of the neck, one on each side of the body a little forward of the middle, and one at the hind end of the back, the three last of these pencils being shorter than the forward ones. Of the four brush-like tufts on the fore part of the back the two first are black, the third one smoky yellowish, and the last one pale yellow or white. Another change of its skin now brings it to its full size.

The MATURE CATERPILLAR is a little over three-fourths of an inch long and of a lurid white color, having a smoky or bluish tinge. It is thinly covered with light yellow hairs radiating from wart-like spots of different colors. On the back is a broad coal black stripe with its hind portion margined on each side with white. On each side of the back are orange red or yellow warts margined with pale yellow, placed on the third, fourth, ninth, tenth and eleventh segments, these warts giving out diverging yellow hairs with an occasional longer black one; and lower down, along the middle of each side is a continuous row of similar warts. Below these is a faint, interrupted blackish stripe, in which the breathing pores are placed; and farther down are two rows of smaller dusky oval warts with pale yellow margins and diverging hairs. The back is surmounted with four brushes or dense tufts of short hairs, placed on the fifth, sixth, seventh and eighth segments, these brushes being usually of a sulphur yellow color, but sometimes white. A pencil of long black hairs with little heads or knobs on their ends projects obliquely forward and outward from each side of the neck. A similar pencil, but shorter, projects horizontally outward on each side of the sixth segment low down. And a fifth pencil, which is thicker than either of the others, projects upward and backward from the hind end of the back, being inserted upon the twelfth

segment. Forward of this last pencil are two vesicles of a bright vermilion red or sometimes of a bright orange color, smooth and shining like sealing-wax, or as though they were wet with varnish. They protrude upward from the middle of the tenth and eleventh segments, and are of a teat-like form, more long than thick, and rounded at their summits when fully distended. Sometimes one of them may be seen wrinkled and retracted to half the size of the other, and in a few moments after, inflated again to its full size. Forward of the anterior vesicle are two small yellow oval dots, and on the next or ninth segment are two similar dots, but larger. The head is black, polished and shining. The underside is yellowish white, and all the legs are light yellow.

When the caterpillar has finished feeding it wanders about until it finds a suitable situation in which to place its cocoon. The corner formed at the lower edges of the clapboards of buildings furnishes such a retreat as it desires, and the cocoons of this moth may frequently be seen here, two or more of them being sometimes placed together, with the fore end of one overlapping the hind end of the other.

The cocoons are an inch and a quarter long and half an inch thick, and are formed of white silken threads, woven in with which are the hairs of the body of the caterpillar. They consist of a dense inner pod or sack inclosed within a looser texture of threads crossing each other in every direction. The whole of the cocoon, however, is so thin and slight that the inclosed inhabitant may frequently be seen through its walls. When the caterpillar first commences forming its cocoon and has inclosed itself inside of a few of the outermost threads of this structure, it finds its pencils of long hairs impede it in turning around within such a narrow space and embarrass all its operations. It therefore plucks out these long hairs, one after another, and to get rid of them, weaves them into the walls of the cocoon with the threads it is spinning. And as the space around it becomes more and more circumscribed as the work progresses, the shorter hairs in their turn are plucked out and similarly disposed of, the skin of the caterpillar thus becoming denuded of all its rigid hairs, including the short ones of the brushes, when the work is finished. Thus it will be seen that it is chiefly the long black hairs with knobs on their ends which are interwoven in the loose outer walls of the cocoon, and only the short yellow hairs of the brushes which enter into the tissue of the more densely woven pod inside.

In a short time after its cocoon is finished the inclosed insect casts off its larva skin. The dry and shrunken relics of this skin, of which the black shining head is the only portion which retains its natural appearance, are crowded backward into the hind part of the cocoon, and the insect now appears in its pupa or chrysalis form.

Guénée says the chrysalis of the female *antiqua* is glabuous and of a yellowish color. Our species is clothed with long white hairs, and its color is greenish white with the back partly or wholly black. It is soft and shining, 0.70 long and 0.30 thick, egg-shaped, ending in a black thorn-like point, the tip of which is furnished with minute hooks which are fastened into the threads of the cocoon, whereby it is securely held therein.

The FEMALE CHRYSALIS has the head and thorax remarkably small and short, measuring only 0.10 in length. The thorax is black and the head is usually of a pale smoky yellowish color with the mouth black, and the eyes sometimes red, sometimes black. The sheaths of the legs, firmly soldered upon the breast, are scarcely a third of the length of the body, the longest pair reaching

slightly upon the base of the third abdominal segment, whilst the wing-sheaths terminate at the suture at the anterior edge of this segment. These wing-sheaths are very faint and almost obliterated towards their tips, whilst their basal portion is more developed and is frequently marked with black lines on their edges and pale brownish lines upon the veins. The abdomen is white with a tinge of green, with the sutures, or at least the anterior ones, marked by a black line. The breathing pores form a row of oval black dots along each side, and a short distance above them the whole back is overspread with black, or varies in having broad black bands with the anterior portion of the segments white or on the fore part of the back tawny yellowish. The back is thinly covered with long white hairs, and on the sides and beneath are clusters of punctures forming round spots from which similar hairs radiate, these spots being placed in four longitudinal rows upon each side, the upper row above the breathing pores and the other three below, the lower spots smaller and with the hairs fewer and shorter. The tip of the body is black.

The Male Chrysalis differs notably from the female. It is a third smaller, glossy, and of a pale tarnished yellow color with the back black and clothed with long white hairs, thus differing from the European *antiqua*, which, according to Guénée, is black and bristly with reddish yellow hairs. It has the thorax much larger than it is in the female chrysalis, and the sheaths of the wings and legs are vastly more developed and larger, reaching two-thirds of the total length. On each of the three anterior segments of the back is an oval transverse spot, formed by short projecting crinkled scales of an ash gray color, which spots do not occur in the female chrysalis.

The moths come out from their cocoons in nine days, making their appearance about the middle of July. The caterpillars which are to become females feed longer and the moths are later in coming from their cocoons than the males. I have known male moths to come abroad before the last female caterpillars of the same brood had commenced forming their cocoons.

The MALE has the fore wings rust color or dull tawny yellow, largely clouded with blackish brown, which color forms a broad curved band extending across the wing forward of its middle, this band through the inner half of its length being forked or double, with the anterior fork broader. Beyond the middle a much broader wavy band crosses the wing, having upon its inner end a snow white spot shaped like a crescent, forward of which is a curved streak separated from the band except at its inner end. The outer part of this band is narrowed into a straight black streak, which extends obliquely forward and outward to the outer margin. And back of this is a brown cloud on the outer margin, reaching to the apex, forward of which it is cut asunder by an oblique grayish streak, a similar streak separating it anteriorly from the outer end of the brown band. A dusky cloud in the center of the wing extends lengthwise from one band to the other, and on its outer side is a paler rusty yellow spot, very faint, crescent-shaped, and margined by a brown line, which is more or less broken and irregular. The base of the wing is also brown on its outer side. The fringe is brown with a rusty alternation at the end of each of the veins. The hind wings are rusty brown, their fringe with very faint paler alternations towards the outer side. On the under side the wings are paler rusty yellow, and brownish on the outer side of the forward pair. The body is coated with hairs and the abdomen with scales of a smoky brown color. The latter has faint paler bands at the anterior sutures and a tuft of short black hairs on the back near its base. It is gray beneath and clothed with short rust colored hairs along the sides and longer brown ones at the tip. The broadly pectinated antennæ have the stalk gray and the branches blackish. My specimens of this moth measure 1.15 across the spread wings.

The FEMALE MOTH is wholly unlike the male in her color and form, and being destitute of wings she appears more like a short thick-bodied hairy worm than like a mature insect. When she comes out from the cocoon she is half an inch in length and half as thick, being broadest slightly forward of the middle. Her skin is black upon the back and dull greenish white upon the sides and underneath, and is coated over with short fine soft hairs

of a yellowish white color, which form pale bands on the edges of the abdominal sutures and a faint pale stripe along the middle of the back. The rudiments of the wings appear on each side of the thorax, in the form of small oval scales of a hoary gray color, which is the color of the legs also. The antennæ resemble short gray threads reaching only to the wing sockets, when they are turned backwards. Along their under side they are dark brown, with projecting sharp-pointed teeth, like those of a saw.

The female remains stationary upon her cocoon and there deposits her eggs, whereby her body becomes diminished nearly one-third from its original size. This operation so exhausts her that as soon as it is completed she looses her hold upon the cocoon and falls to the ground and dies. She thus lives only about twenty-four hours in her mature state, whilst the male continues to fly about, actively, for several days at least.

In one instance a female lost her foothold upon the cocoon, and falling, caught hold of the clapboard a short distance below it; and I relate the circumstance as showing how very little these wingless females are able to walk and move about, that she did not attempt to crawl back to the cocoon, but, clinging to the spot where she was, deposited her eggs there, upon the smooth surface of the board, only three inches below the cocoon.

The Eggs are placed in a cluster side by side, in nearly regular rows upon the outside of the cocoon, to which they are firmly glued. They are of a white color, like enamel, and of a globular form, with their upper part constricted and flattened, resembling a lid placed upon the summit of the egg. This lid is of a purer white color and opake, with a discolored band around its outer edge and with its center strongly depressed, forming a dimple, in which is a glossy pale brown dot.

The eggs are left naked and not covered over with the white frothy substance with which the female of the *leucostigma* covers and hides her eggs. And being left thus exposed, these eggs fall a prey to a minute parasitic insect, a black shining four-winged fly with pale tarnished yellow legs, which pertains to the Order HYMENOPTERA, the Family PROCTROTRUPIDÆ and the group PLATYGASTRIDES. In its size and general appearance it is very similar to the Mistaken Parasite, figured in my Sixth Report (Plate 1, fig. 4), and I name it the Egg-Parasite of the Vaporer Moth, although it is quite probable that future researches will show that it is not restricted to these insects but preys also upon the eggs of other moths of similar size. It differs generically from the Mistaken Parasite, in having a straight oblique branch given off from near the middle of the outer marginal vein of the fore wings. I present a detailed description of this fly.

EGG-PARASITE OF THE VAPORER MOTH, *Telenomus Orgyiæ*, new species. (Hymenoptera. Prostotrupidæ.)

Length 0.03, or to the end of the closed wings 0.05. Black and shining, with the legs dull pale yellowish. Head as broad as the thorax, twice as broad as long, convex in front, concave at base, and rounded on each side, its surface sparsely bearded, at least in places, with short inclined hairs; the eyes more densely and evenly bearded with short erect hairs. Antennæ black, clothed with a short inclined beard, half as long as the body, inserted near the mouth, elbowed, clavated, ten-jointed, the five last joints forming an elongated egg-shaped club. Basal joint long and thick, occupying one-third of the total length, slightly curved, rather thickest in the

middle, narrowing towards the base and very slightly towards the tip. Second joint twice as long as thick, obconic, and a third narrower than the basal joint. Third joint similar in length and thickness to the second, cylindrical. Fourth and fifth joints globular and of the same thickness with the preceding two. Sixth joint a third thicker, globular. Seventh and eighth joints thickest of all, their outline square, opposite sides straight and parallel, base and apex slightly convex. Ninth joint of the same form but a little smaller. Tenth or last joint narrower and a very little longer than the ninth, egg-shaped. Thorax broad egg-shaped with a deeply impressed transverse line across its disk back of the center. Abdomen sessile, smooth and highly polished, similar to the thorax in its size and form. Wings horizontally incumbent upon the back when at rest, smoky hyaline, the fore pair with a straight stigmal branch arising near the middle of the outer margin and running obliquely inward and backward, ending abruptly without being enlarged into a knob or head, its length about equal to one-third of the width of the wing. Legs much more slender than the antennæ and rather long, the forward pair shortest, with their shanks thick, elliptic-obovate, and having a strong curved spur on the underside towards the tip. Shanks of the other legs long and slender, and gradually thicker towards their tips, the hind ones longest. Feet long and thread-like, longer than the shanks on which they are respectively inserted, their basal joint longest and occupying a third of the total length, the second and fifth joints about equal in length and perceptibly longer than the third and fourth.

This parasite passes around and punctures the shell of each egg of the Vaporer Moth, inserting a minute egg of its own inside, from which hatches a maggot which feeds upon and consumes the contents of the moth's egg. Each one of the latter eggs is supposed to contain the exact amount of nourishment required for the growth of one of the parasites. Hence the parent fly is cautious to never puncture an egg which is already occupied, being aware that its young will perish from starvation should two of them happen to be placed in the same egg. In the instance which came under my observation, seven of these minute flies were engaged upon one cluster of eggs, walking slowly about and around them, and examining them with their antennæ; and with a magnifying glass I could distinctly see one and another of them with its sting inserted into an egg, thus leaving no doubt as to the nature of the work in which they were engaged. I managed to capture two of these flies, and being called away from home, on my return three days afterwards the remaining five were still present, busily engaged in their operations. On the following day, however, only two of them were remaining. That such a number of these flies should continue day after day upon the same cluster of eggs shows how pertinaciously they follow up this work, never abandoning it until they become fully assured that the last egg in the cluster has been ferreted out and inoculated. Although there were two other clusters of eggs at distances of only six and ten feet, not one of these flies discovered them—which indicates that there was some peculiarity about that particular cocoon, whereby such a number of these flies were able to find it and failed to detect the other two in its vicinity.

As the Common Vaporer Moth, *O. leucostigma*, covers her eggs copiously with a white frothy substance which dries and hardens upon them, completely enveloping and hiding them from the view, this parasite is unable to come at them to destroy them; and this is no doubt one of the causes if not the sole cause why that species is so much more numerous than the present one in our country.

It is rarely that the caterpillars of this moth will occur in such numbers on our trees and shrubbery as to excite any solicitude. Should they do so

our readiest mode for lessening their numbers will be to pick off each leaf on which one of them is standing and trample it under the foot, if one can find it in his heart to thus treat such beautiful objects as they are. Their numbers around our dwellings may also be lessened by searching for their cocoons under the edges of clapboards, in the grooves of the rough bark of trees, and similar situations, and wherever one of them is found with a cluster of eggs upon its surface, tearing it from its place and throwing it into the fire.

In conclusion, I may add that the Common Vaporer Moth has been very abundant in the city of Albany for several years past, where its larva has acquired the name of the Little Yellow Caterpillar. It here appears to be increasing with each succeeding year, and has this season (1863) been so numerous that in some of the yards and gardens I have seen large plum trees wholly stripped of their leaves by it and the rose bushes similarly defoliated. On the 21st of July the caterpillars have nearly all disappeared for the season, and I have to-day met with the insect in all its different stages—some of the CATERPILLARS still remaining out upon the rose bushes, whilst most of them have formed their cocoons and changed to PUPÆ, some of which have already given out the PERFECT INSECTS, and the winged males, recognized by their smoky gray color and the white dot on the inner hind corner of their wings, are seen at rest on the shaded side of buildings, and occasionally a cocoon shows on its surface the milk-white patch of dry frothy matter under which the female has hid her EGGS. As these eggs will remain unhatched until next spring, this nuisance, the Yellow Caterpillar, might be greatly abated, were every person after the leaves have fallen, in autumn or in winter, to search for these cocoons under every projection in the walls of his buildings and in his fences, and upon every dead leaf which remains hanging upon the limbs of the trees and shrubbery, and wherever one of the cocoons is found having this white foam-like substance upon it, making it a point to tear it from its place and burn it.

8. HAIR-NECKED ROSE-BUG, *Macrodactylus barbatus*, new species. (Coleoptera. Melolonthidæ.)

Associated with the Rose-bug, devouring the leaves and fruit of roses, grape vines, apple and other trees, the latter part of June, a beetle like it in every respect, except that its thorax is slightly more broad than long, and is bearded with small erect short bristles.

As this report is being closed for the press (June, 1863,) specimens of the Rose-bug are sent me from Stillwater, Saratoga County, as an insect which is there making its appearance in vast numbers in the fields of young rye, corn and potatoes; and a gentleman from Saratoga Springs calling upon me, states that in some of the gardens there the grape vines are so thronged with these beetles, eating the fruit and leaves, as to threaten to ruin them, whilst there are great complaints of it also as devouring the young plants of Indian corn in the fields.

In my Second Report was given a description and figure of the Rose-

bug, *Macrodactylus subspinosus*, with details of its history and habits. In the eastern section of the State of New York, there usually occurs associated with this insect, individuals which we must regard as a second species, differing from it merely in having short stiff hairs upon its thorax, jutting up from the smooth surface like the beard upon a man's face, this beard being of a buff-yellow color, and differing also in the relative dimensions of the thorax, it being rather more wide than long, whereas in the common species its length slightly exceeds its width. Of the seven specimens just received from Saratoga County, two are of this kind. This hairy broad-necked species has generally been confounded with the other. Dr. Bunmeister was the first to point it out as being distinct, and he supposes this to be the real *subspinosus* of Fabricius, and accordingly describes the smooth narrow-necked species under the name *polyphagus*, which had been applied to it in Melsheimer's Catalogue. Dr. Le Conte, in his synopsis of the Melolonthidæ of the United States, published in the Journal of the Academy of Natural Sciences cotemporaneously with the appearance of my Second Report, follows Burmeister in applying the Fabrician name to this hairy-necked species, and adopts for the smooth-necked species the name *angustatus*, heretofore given to it by Beauvois. And he supposes the two species to inhabit wholly distinct sections of our country, assigning New York as the locality of the hairy-necked beetle whilst the other is found only in the Southern States and Kansas. But different correspondents have sent me the smooth-necked species from different parts of the State of New York, from Massachusetts, Rhode Island, Pennsylvania, Maryland, Virginia, Ohio, Illinois, Kansas, and the Indian Territory south of Kansas. It is perfectly evident, therefore, that this species is not limited to the South and West, as Dr. Le Conte supposes, but occurs throughout the Northern and Middle States also. On the other hand, the hairy-necked species has never been found, that I am aware, except in the State of New York. My specimens of it are from the city of New York, from Albany, from the neighborhood of Utica, and from Washington and Saratoga Counties. So far as yet appears, therefore, this species occurs only in the valley of the Hudson River and its tributaries. As Dr. Le Conte cites Dr. Harris's Treatise as describing the hairy-necked species he must evidently infer that this species inhabits Massachusetts also. But this citation was probably made without due attention to the description of the insect given by Dr. Harris. Though he does not state whether the thorax of his insect is smooth or bearded, he says this part of its body is long and narrow, which precludes us from regarding it as this species, in which the thorax is wider than long. And knowing as we do that the smooth-necked species occurs in Massachusetts, we cannot doubt it was this which Dr. Harris had before him; as it was also the species from which the description given in my Second Report was drawn, as will be evident by reference thereto.

The question now remains, was I correct in pronouncing this smooth and narrow-necked species to be the *subspinosus* of Fabricius, or are Drs. Burmeister and Le Conte correct in applying this name to the bearded and

wide-necked species? As this Rose-bug is one of the most common and formidable injurious insects of our country it is important that we have its nomenclature correctly ascertained and permanently settled.

On referring to the fullest description which Fabricius has left to us of the species which he names *subspinosa*, that contained in his Entomologia Systematica, vol. ii, p. 178, we find it applies alike to both of the species, none of the terms which he employs giving any indication which one of the two he had in his view. And the same remark is true of the still more detailed description, cotemporaneously given by Olivier (Entomologie, i, 5, p. 70). There being nothing therefore in the original definitions of the *subspinosus* whereby we can decide to which of these two species this name rightfully belongs, if we were left to the general fact that the one species is common throughout the United States, whilst the other is quite local, occurring only along the Hudson River, where the other species is associated with it and is usually the more numerous of the two, the presumption would be strong that it must have been the former of these species which had found its way to Europe and was the insect with which these old authors were acquainted. But in addition to this, other incidental evidence is furnished us which must be regarded as decisive upon this subject. Fabricius cites the *M. elongata* of Herbst as being the same insect with his. If we admit this citation to be correct, it is conclusive upon the point at issue, Herbst's species with the "flachliegenden Härchen," the flat-lying little hairs, being evidently the smooth necked one. Fabricius further gives the West India islands as the locality where the *subspinosus* occurs. Surely this must preclude us from regarding an insect found only in the State of New York as being his species. It appears from Dejean's catalogue and from several other authorities that the same insect which is found in the United States, is found in different parts of the West Indies also, and from Lacordaire we learn that its geographical range reaches south into the republic of Colombia. Thus, the proof seems to be conclusive that it is the smooth narrow-necked species to which the name *subspinosus* rightfully pertains.

We are thus left without a name for the other species, and I therefore propose to term it the *barbatus*, the bearded or Hairy-necked Rose-bug. As already stated, it is the *M. subspinosus* of Burmeister and of Le Conte, but not of Fabricius, Olivier, Latreille, Harris, and others. In the description of *subspinosus* given by Latreille, occurs the phrase "thorace angusto," the thorax narrow, clearly showing it is not this wide-necked species to which he refers.

It is difficult to ascertain the dimensions of these Rose-bugs with accuracy, in our dried cabinet specimens, the thorax and head being inclined downwards much more in some of them than in others. My specimens of this Hairy-necked species vary in length from 0.30 to 0.38, showing there is no such difference in their size as has been reported, whereby this species can be distinguished from the other. Nor, on the underside of the abdomen in the females of the smooth-necked species do I detect any bristles, which are stated as occurring in it, on the middle of the four anterior segments.

In both species alike, the pygidium or exposed tip of the abdomen is usually black, but not unfrequently it is pale dull yellowish, and sometimes the whole underside of the abdomen is of this color. Thus only the hairiness and width of the thorax remain to us as characters which are constant and reliable, whereby to distinguish this species.

The transformations and habits of this insect are the same, no doubt, with those of the common Rose-bug, full statements of which have already been presented in my Second Report. And the same modes of combating and subduing it whenever it becomes numerous will require to be resorted to.

APPENDIX.

Historical Notice of the first starting of the Hessian Fly in this Country.

In the account of the Hessian Fly given in my last Report, I state that it is a European insect, which was introduced into this country, probably in some straw used in package, by the Hessian troops which landed on Staten and the west end of Long Island, August 1776, but it did not become so multiplied as to attract general notice in that neighborhood, until 1779; and from thence as a central point, it gradually extended over the country in all directions, advancing at the rate of from ten to twenty miles a year.

In my History of the Hessian Fly, published in the Transactions of the Society for the year 1846, I endeavored to present as particular an account of the introduction of this insect and its subsequent advance from one locality to another as the information which I was able to find upon this subject enabled me to prepare. In that article, (page 325) the following statement is given of the first starting of this insect in this country:

"From the 'flax seeds' casually lodged in the imported straw, only a few flies would probably be evolved, to deposit their eggs upon the young wheat in the autumn of 1776; nor would these have multiplied to such an extent in the following spring as to attract attention at the time of harvest. But, increasing with each successive brood, by the harvest of the following year, 1778, we might anticipate its being observed, and by a year thereafter, it would become so numerous that its real character would no longer be in doubt. And in accordance with this, we are informed by Colonel Morgan, that 'the fly made its first appearance in 1778;' and Mr. Clark, who in 1787 went to Long Island expressly to gather authentic information respecting this insect, says in his report, 'I satisfied myself in the following particulars, namely: first, that the Hessian Fly made its first appearance there about the year 1779, so as to injure, and in some cases to destroy their crops of wheat.' And an anonymous writer in Carey's Museum (vol. i, p. 143) gives the same year as about the period of its discovery. We therefore regard the year 1779 as most probably the date when its ravages commenced."

The opinion which I thus expressed becomes somewhat modified by a statement which I meet with in the lately published Colonial History of our State, vol. viii, p. 783, which indicates that this insect had become more multiplied and had penetrated farther into the country in the year 1779 than my previous information had led me to suppose. From the document alluded to it appears that in December, 1779, a tory named John Pell, of

the town of Sheffield, near the southwest corner of Massachusetts, made his way to the city of New York, where he gave information to the British authorities, of the condition of the country between the Connecticut and the Hudson rivers, one of the items of which is as follows:

"That no wheat is to be bought for the Continental money—nor for hard money under twelve shillings (probably New England currency, i. e. two dollars) a Bushel, which is more than double the old price prior to the public troubles. That many dread a famine, the last Harvest being short on account of *a blast* which was general thro' the North country, and *a fly* which before the snow falls of this Winter devoured the green blades so that a part of almost every field, and some entire fields were perfectly eaten up and destroyed, and the fields in some instances resown or reserved to be ploughed up in the winter if the frost would permit or in the spring."

I think there can be no doubt it was the Hessian Fly, then newly arrived in the country and its habits wholly unknown, which occasioned the remarkable disasters to the wheat crop here stated to have occurred over the southwestern part of New England in the year 1779. What is here termed a blast in the wheat harvested that year was probably that shrinking of the kernels which the pupæ or "flax seeds" of the Hessian Fly cause when they are nestled at the lower joints of the straw, and which, if they were noticed at the time, would scarcely be suspected of occasioning this shriveling of the kernels, their location being so far distant from the heads. And the fly which destroyed the young green wheat in autumn to such an extent that many fields were plowed up and resown, was the succeeding generation of the same insects, nestled now in the roots, and causing the young wheat plants to wither and die. This insect therefore, imported to our shores as we do not doubt in some straw landed at the west end of Long Island in the summer of 1776, and beginning to breed there in the fall sowed wheat of that year, in the course of three years or its sixth generation in this country, had become so multiplied and spread that it was destroying the wheat crop and exciting fears of famine over at least a considerable portion of the country between Berkshire County, Massachusetts, and the city of New York. It thus appears on the outset of its career upon this side of the Atlantic, to have advanced to the north twice as rapidly as it did to the east, whilst to the south and west its progress was very much slower than in any other direction.

As every fact relating to the first introduction of this important insect and its subsequent advance over our country merits to be carefully preserved, and as the statement which I have quoted above was written six years earlier than any which I had before been able to find, and is probably the first allusion to the Hessian Fly in this country which is now extant, I have deemed it of sufficient consequence to be thus particularly noticed.

THE EARTH-WORM, *Lumbricus terrestris*, Linnæus.

The Earth-worm, the long, cylindrical, reddish worm, which is so very common everywhere in rich ground and is in such universal use as a bait

EARTH-WORM. IS NOT THE LARVA OF AN INSECT. FEEDS ON EARTHY MATTER.

for angling, we cannot but regard as being identical with the corresponding worm of the European continent, named *Lumbricus terrestris* by Linnæus, though some have supposed it to be probably a distinct species. When we recur to the fact that this worm is so common in gardens that every box and pot of earth in which live plants are carried from one continent to the other, will be liable to contain some of them and transport them over the ocean, we see how very improbable it is but that the species of the one continent will be common on the other continent also.

As a notable instance of the manner in which men of science sometimes toil and waste their energies in heaping up piles of dust to be scattered and dispersed by the next wind which passes by, we have the fact that M. Savigny distinguished and described twenty species of these worms which subsequent naturalists regard as merely varieties of one common species.

We have here an example of a worm which is not the larva of an insect. This Earth-worm undergoes no metamorphosis; it always retains the form in which we are accustomed to see it. It is most nearly related to the leech and the hair-snake, and is accordingly associated with them in the class of animals to which the name "Worms" in strictness belongs. It consequently does not pertain to the department of my investigations. I however notice it, for the purpose of reporting some observations which have incidentally occurred to me, and which are deemed to be of interest as throwing additional light, particularly upon the food upon which this creature subsists, and upon the holes or burrows which it makes underground.

It is currently stated by authors that these earth-worms feed upon earthy matter, from which they digest the fine vegetable mold contained therein, and eject the remainder at the mouths of their burrows. By crawling about in the ground as they do, they are most important and serviceable agents in loosening the soil and opening it for the air and water to penetrate it. And by throwing out their castings at the mouths of their holes, they add to the depth of the soil, and cover tracts that are comparatively barren, with a superficial layer of fine, fertile soil. Hereby also, as many who read these lines will probably remember to have observed, a stone or chip which is lying upon the surface of the earth where the ground remains undisturbed, will in a few years become sunk wholly beneath it. It is some ten years ago, that, in flagging a walk in my yard, several large flat stones which were rejected as being too thin and unsubstantial for this work, were carried aside to an unoccupied part of the yard and laid upon the grass, with the thought that some use to which they might be appropriated would perhaps occur. By the grass growing over their edges they in two or three years were hid from view, and had become totally forgotten, till recently, happening to strike a hoe in the ground there, they were re-discovered. They were found to be sunk, each one, about an inch below the surface, being overlaid to this depth by fine gritty earthy matter, with only its upper part permeated by the roots of grass. I could attribute this deposit of earthy matter upon the upper side of these refuse flagging stones to nothing else than the operations of earth-worms. Instances of a

similar character are related by Charles Darwin, Esq., in a paper "On the Formation of Mould," published in the second volume of Proceedings of the Geological Society of London, one of which is that of a pasture field undisturbed by the plow, and which had received a heavy top dressing of lime twelve years and of cinders three years previously. On examination, lumps of the lime were found, forming a well marked white line at a uniform depth of two inches below the surface, and at the depth of one inch was a line of black spots, formed by the remains of the cinders; the soil below the white line being gravelly and differing very perceptibly from the fine mold above it. Such facts show us what important and valuable agents these earth-worms are, in keeping the superficial portion of the soil in a most salubrious condition for the growth of vegetation.

These worms also feed upon dead leaves and other decaying vegetation; and hereby they are liable in some cases to become annoying to the gardener. When making my garden a few years since, from among the refuse onions remaining in the cellar, a bed of escallions was planted. Soon after, I was surprised to find that the onions which had thus been set out were pulled over and lying prostrate upon the ground, all of them having their dead tops drawn into holes about the size of a goose quill which were perforated in the ground; and to enable the tops to be thus turned down into these holes, the whole onion had in several instances been drawn two or three inches away from the place where it had stood. They were immediately restored to their places, but next morning several of them were found again pulled down in the same manner. And thus, for some time subsequently, a portion of these onions were reset deeper and with the earth pressed more firmly around them, each day, and continued to be uprooted by night, several of them perishing from being thus disturbed. I was in doubt as to what creature it was that was attacking the onions in this manner—drawing the decaying tops into its hole by night that it might feed thereon during the day time without exposing itself to observation. The holes appeared like those of the earth-worm, but I did not deem this worm able to grasp bodies of such size as were these onions, and draw them along upon the surface of the ground. As it might possibly be some new and strange insect which had arrived and established itself here, I resolved to ascertain decisively what it was. Repairing to the spot with a lamp at different hours of the night failed to reveal the creature engaged in its operations, and I finally determined to trace one of the burrows, by digging, until I came to the animal in it. By inserting a straw in one of the holes, and crowding it down further and further as I carefully removed the earth from around it, I found the hole descended almost perpendicularly till it came into very hard compact soil below where the ground had ever been disturbed by the garden operations of plowing and spading. At length, on reaching a depth of about fourteen inches from the surface, the burrow abruptly turned from a perpendicular to a horizontal direction, and following it as well as I was able to do at such a depth and in such firmly compacted gravel, it here appeared to form one of a multitude of horizontal burrows, winding about in every direction, whereby the ground seemed to

EARTH-WORM. ITS UNDER-GROUND BURROWS. IT EATS GREEN LEAVES ALSO.

be perfectly honey-combed. All doubts that it was the earth-worm which I was pursuing were now dispelled; and I became aware it would be impossible to find the animal by following it up in its burrow, as these burrows were now discovered to be interminable, and the worms would retreat from me therein with infinitely more celerity than I could follow them.

I hence conclude that the principal residence of these earth-worms is at a depth of some sixteen inches from the surface, and below where the frost of winter penetrates; and here, in places where the surface soil is rich and the worms are numerous, the earth is mined by their burrows running in every direction, like the streets of a populous city. Another fact indicating that the earth is thus mined, has occurred to my notice. In striking into the soil of the garden with an iron bar, making holes into which to set bean poles and for other purposes, I have repeatedly been surprised to find that the bar, after penetrating the firm earth to a depth of some sixteen or eighteen inches, would then come into remarkably loose soil, whereby, by merely working the implement backwards and forth, its own weight would carry it down some distance further—the bar sometimes going down with such suddenness and ease as to excite a suspicion that it would become lost from dropping into a cavern in the ground there. Other persons, I am sure, must have observed this same fact. Heretofore I have been at quite a loss to account for such a looseness in the soil at such a depth. I now suppose it is caused by the multitudinous burrows of these earth-worms.

From this underground retreat, holes extend upwards to the surface, from which by night the worms come abroad to feed and to draw a supply of food into the mouths of their holes that they may consume it unmolested during the day time. This drawing of food into the mouths of their burrows is a common habit of these worms. The middle of June, 1860, in examining a cornfield which had been much injured by the frost a few nights before, I observed the ends of the dead blades of the young corn were in numerous instances drawn into the holes of the earth-worms. And in grass lands I have also found the lower dead leaves of the grass, several inches in length, drawn into these holes in the same manner. It is probably by coiling one end of its body around the blades of grass that it draws them to the mouth of its burrow, the minute bristles with which each of its rings is furnished, aiding it in clinging to the substance which is thus to be moved. That they are able to hold to and draw over the ground bodies of such size and weight as were the onions, shows that they have a power of prehension and avulsion, a power of grasping and pulling, which much exceeds anything of this kind which they are commonly supposed to possess.

But, in addition to feeding upon earthy matter and upon dead and decaying leaves, these worms also attack vegetation which is green and growing. I have been reluctant to believe this, until instances have presented themselves to my notice, putting the fact beyond all question. They are particularly prone to fall upon and appropriate to their own use tender garden vegetables which have been newly transplanted, the leaves of which, being flaccid and pliant from being slightly wilted, they draw

into the mouths of their holes and consume, and not unfrequently the plants themselves are hereby uprooted and drawn away from the places where they had been set. In other instances, without drawing them under the ground, where two or three slightly wilted leaves are lying together upon the surface, keeping it moist and shaded from the sun's rays, these worms delight to ascend there in the day time and feed upon the under portions of the foliage. And when in this situation, on discovering the near approach of a person, they are so startled as to make a perceptible rustling and agitation of the leaves in their haste to retreat into their holes. Thus transplanted lettuce, turnips, etc., are liable to be injured and some of the plants to be destroyed by these worms.

Another calamity frequently befalls some portions of the beds in our gardens when the seeds sowed therein first start out of the ground. Rows of young plants which we to-day notice as having come up profusely and finely, it may be are to-morrow observed to have large vacant spots in them, and in a few days more perhaps not a single plant is remaining. Cut worms sometimes destroy small portions of the rows in this manner; but then some of the small wilted leaves are seen, drawn partly into a crack in the ground, at which place it is also noticed that the surface soil has been newly loosened by the worm in entering the ground there, and on digging the worm itself is found lying slightly under the surface. But here, the beds, or large portions of them, are swept clean, with no wilted leaves left, no disturbance of the soil, no trace whatever to indicate to us the enemy that has destroyed the newly sprouted plants, save only that holes of the earth-worms are seen here in the beds the same as in all the surrounding soil. And I am persuaded it is these worms issuing from their holes by night and feeding upon the tender newly sprouted plants, which occasions their sudden disappearance in this manner.

I may further remark that in young cabbages, beans, and other garden vegetation, we frequently see a large hole eaten in a leaf or a portion of its margin consumed, when no caterpillars, cut worm, or other insect larva to which we can impute this casualty, is to be found upon or anywhere near the plant. And I believe it is often these earth worms which thus wound the leaves, although to do so they must in some of these instances ascend the stems of the plants such a distance that little if any of their body remains upon the ground.

I have my life long deemed these worms to be perfectly innocent of harm and serviceable to us by keeping the ground loosened and porous. But within a few years past, having come to look particularly at their operations, I am forced to change my opinion. In our plowed fields, our meadows and pastures, they are probably to be regarded as doing more good than harm. But where they become so multiplied as they do in the rich soil of our gardens they are a pest and a nuisance.

Have we any remedy against these worms? Upon this point I have not yet sufficient experience to enable me to speak with confidence. I have observed that when a light approaches them in the night time they immediately retreat underground, and it therefore appears probable that if a

EARTH-WORM. A FORKED EARTH-WORM.

lighted lantern were placed in the garden during the night, none of these worms would come abroad near it. I have also noticed that if one of these worms is dropped upon a spot where the surface is sprinkled over with ashes or with salt, the worm writhes and twists apparently in misery, coiling and tying itself into knots as if endeavoring to wipe off the irritating substance from its skin. Around the vegetation, therefore, which I find to be molested by these worms, I am resorting to a top dressing of unleached ashes, with the hope of thus protecting it from them.

A singular monstrosity occurs in one of these worms which was found in my garden the past season. It is a young worm about three inches long, having the hind end of its body forked or divided into two branches nearly a fourth of its length. The forks are cylindrical, of equal length and thickness, and about a third less in diameter than the body forward of them. When it was first taken in the hand both forks were noticed to discharge their earthy feces alike. The structure, where the forks commence, may be briefly described as follows: The fork which is on the left side continues the rings of the body regularly onward, three of the rings successively diminishing in diameter reducing the thickness from that of the body to that of the fork; and the suture by which the first of these three rings is united to that which precedes it, opens widely apart on the right side, forming the base upon which the right hand fork is inserted—this fork showing a very slight contraction or neck at its commencement, whilst the left hand fork has no corresponding contraction at its base.

The specimen is preserved in a vial of spirits, in the Museum of the Society, the spirits having contracted it in length about one-third.

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AGRICULTURAL STATISTICS.

The Legislature passed, April 17th, 1862, an act to provide for the collection of agricultural statistics in the several counties of this State.

This act provided that the county agricultural and horticultural societies, and in cases where there were no county societies, town societies that receive an annual appropriation of money and books, or either, from the State treasury, should procure the collection of the statistics of agricultural and horticultural products and improvements each year, in the respective counties, by procuring proper answers to such questions as shall be contained in blanks to be provided for that purpose.

The officers of these societies are required to appoint suitable persons for each school district and joint school district, to procure answers from all persons residing in their districts, and to furnish them with the necessary blanks by the first of January; and the persons so appointed were to have said blanks filled up and returned to the presidents of societies, properly added up, so that they might be forwarded to the Secretary State Agricultural Society by 1st February.

The Comptroller was required to provide blanks, which were to be prepared by the Executive Committee of State Agricultural Society, and furnish them to the presidents of said county and town agricultural or horticultural societies.

Provision was made for the appointment of officers to do the duties prescribed, in those counties where there were no societies, and provision was made for those taking the statistics in school districts, who were to receive each a volume of Transactions of the Agricultural Society and one of the American Institute; and the county societies were authorized to draw their usual allowance of money without raising an equal sum, on furnishing the report required.

The Executive Committee prepared the forms containing such questions as they deemed best adapted to secure the objects of said act, which were submitted to the Comptroller and by him approved, and were printed under his direction and sent to the officers of the several societies as required by said act.

The time limited for taking the statistics, and the delay in preparing the blanks, which was unavoidable, have prevented as full a performance of the work as would have been accomplished had the blanks been earlier ready for distribution; and it is hoped that another season the blanks will be delivered early enough, so as to enable the persons taking the statistics to make their returns promptly by the 1st of February, thus giving time to prepare the abstracts from the same.

The circular issued by the Comptroller, with a copy of the act and the table of forms, are annexed.

It is respectfully suggested that abstracts of the reports, as far as they may be received, be embodied with the annual report of the State Agricultural Society, thus bringing them directly to the farmers of our State.

On behalf of the Executive Committee,

Respectfully submitted,

B. P. JOHNSON, *Secretary.*

CIRCULAR.

STATE OF NEW YORK, COMPTROLLER'S OFFICE,
ALBANY, *November*, 1862.

President Agricultural or Horticultural Society of the County

The accompanying blanks for the collection of the statistics of agricultural and horticultural products and improvements in the several counties of the State, have been prepared in pursuance of an act of the Legislature, passed April 17th, 1862, (a copy of which act accompanies this notice.)

The duties required are set forth in said act in sections 1, 2 and 3.

THE BLANKS TO BE FILLED UP.

In the first column, *name of town, number of school district and names of producers* to be inserted; and, on the same line, answers to the various questions at the head of the papers delivered, are to be inserted. When the answers are obtained from all the residents of a district, and properly entered, the blanks so filled up are to be returned to the president of the agricultural or horticultural society, or other proper person appointed to receive them as provided in said act, who will cause the same to be addressed and forwarded to the Secretary of the State Agricultural Society, *after the same shall have been added up*, as provided in section 3d of said act.

The compensation for the discharge of these duties is provided for in sections 4th, 6th and 7th.

It is expected that the duties imposed by the act of the Legislature will be promptly performed by the persons appointed, and the returns forwarded as early as the 1st of February, 1863, to the Secretary of the State Agricultural Society, Albany.

LUCIUS ROBINSON, *Comptroller.*

AN ACT

To Provide for the Collection of Agricultural Statistics in the Several Counties of this State.

Passed April 17, 1862; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. It shall be the duty of all county agricultural or horticultural societies, or, in the absence of such county societies, town societies, that receive an annual appropriation of money and books, or either, from the State treasury, to procure the collection of the statistics of agricultural and horticultural products and improvements each year in their respective counties, by procuring proper answers to such questions as shall be contained in blanks to be provided for that purpose.

§ 2. It shall be the duty of the board of managers, or other proper officers of such county agricultural or horticultural societies, or in the absence of such county societies, the presidents of the several town societies which receive money from the State, to select and appoint some suitable person in each school district and each joint district in said county, whose duty it shall be to procure the proper answers from all persons residing in the said school district or joint district to the questions contained in the blanks to be furnished for that purpose, and the said board of managers or president shall furnish the person so appointed with the proper blanks on or before the first of January of each and every year, with such instructions as may be necessary to his correct understanding of the duties to be performed.

§ 3. The persons thus appointed in the several school districts and joint districts shall proceed at once to procure the proper answers to the several questions contained in said blanks, by calling on the persons of whom the information is to be obtained, or in such other manner as in the judgment of said officers may best secure the correct answers; which answers he shall enter upon said blanks, under their appropriate heads, and opposite the names of the respective persons from whom they are obtained. When the answers shall have been obtained from all the residents of said districts, and properly entered upon said blanks, the said blanks shall be returned to the president of said agricultural or horticultural society, who shall cause the same to be added up, and the aggregate result for each school district or joint district entered in a column on similar blanks, opposite the number of the respective district, in such manner as to show the result in each town by school districts, which blanks containing such aggregate results shall be forwarded to the Secretary of the New York State Agricultural Society, on or before the first of February in each year.

§ 4. The several officers appointed in school districts, as provided in section two of this act, and who shall perform the duties of said office, shall be entitled to receive and shall be furnished by the president of the agri-

cultural or horticultural society of his respective county one copy of the Transactions of the New York State Agricultural Society, and one copy of the Transactions of the American Institute, published for the year that the statistics thus collected represent. The county agricultural or horticultural society, or, in the absence of such county societies, the town societies, whose officers shall faithfully perform the duties specified in the several sections of this act, shall be entitled to receive from the Comptroller of this State such amounts of money annually as they have heretofore been authorized to receive under the provisions contained in the act entitled "An act for the encouragement of agriculture," passed May fifth, one thousand eight hundred and forty-one, an act to amend an act entitled "An act to promote agriculture," passed May fifth, one thousand eight hundred and forty-one, and the acts amendatory thereof, passed April sixteenth, one thousand eight hundred and sixty-one, without procuring a like sum to be raised by subscription or otherwise, as provided by said act.

§ 5. It shall be the duty of the Comptroller to provide blanks by the first day of December in each year, of such form and containing such questions as shall be approved by the Executive Committee of the New York State Agricultural Society, and furnish the same to the presidents of said county or town agricultural or horticultural societies, with such instructions as shall enable said officers to discharge the duties required of them as contemplated by this act.

§ 6. If there should be any counties in this State in which there is no such agricultural or horticultural society, or town societies, receiving appropriations from the State treasury, then it shall be the duty of the Executive Committee of the New York State Agricultural Society to appoint a suitable person in each of said counties, whose duty it shall be to appoint suitable persons in the respective school districts of his county, as provided in section two of this act; and the persons so appointed shall proceed in all respects as if they had been appointed by the board of managers or other officers of a county agricultural or horticultural society, as provided by section two of this act.

§ 7. Such persons as shall be appointed by the Executive Committee of the New York State Agricultural Society, shall be entitled to receive a suitable compensation, to be paid out of any moneys that would properly belong to a county agricultural or horticultural society, if such society existed in said county, and the Treasurer of the State shall pay such sum, on the warrant of the Comptroller, to be given on the certificate of the Secretary of the State Agricultural Society, that such service has been duly and faithfully performed, but such compensation shall not in any case exceed in amount the sum that such county agricultural or horticultural society would be entitled to receive.

§ 8. This act shall take effect immediately.

Agricultural Statistics of *County for the Year* 1862.

Town of / School District No. / NAMES OF THE PRODUCERS.	GRASS LANDS.				SPRING WHEAT.		WINTER WHEAT.			OATS.		RYE.		BARLEY.		BUCKWHEAT.		CORN.			REMARKS.
	Acres of pasture.	Acres of meadow.	Tons of hay.	Bushels of grass seed.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested	Acres sown last fall, and now on ground.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres planted.	Bushels harvested.	Acres broom corn	Lbs. broom corn.	

Town of / School District No. / NAMES OF THE PRODUCERS.	POTATOES		PEAS.		BEANS		ROOT CROP.			FLAX.			TOBACCO.		HOPS.		BEES.		NEAT CATTLE .			BEEF.		REMARKS.
	Acres planted.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres planted.	Bushels harvested.	Acres sown.	Bush. turnips harvested.	Bush. beets harvested.	Bush. carrots harvested.	Acres sown.	Pounds lint or straw.	Bushels seed.	Acres planted.	Pounds harvested.	Acres planted.	Pounds raised.	No. hives.	Pounds honey.	Pounds wax.	No. oxen.	No. cows.	Other cattle besides calves.	Calves raised.	Number of cattle lost by disease.	No. beef cattle sold.	No. beef cattle slaughtered.	
	Any rot.																										

Town of / School District No. / NAMES OF THE PRODUCERS.	DAIRY.					BARN-YARD MANURE.	SWINE.		SHEEP.			POULTRY.		FRUIT CROP.							REMARKS.
	No. cows milked for butter.	No. pounds butter.	No. cows milked for cheese or sale of milk.	No. pounds cheese or gallons milk sold.	Value of market produce, garden	How many loads barn-yard manure made on the farm.	No. of hogs raised.	No. of hogs sold alive.	No. of hogs fattened and killed.	Lbs. pork killed.	No. sheep killed by dogs.	No. sheep wintered last winter.	No. lambs raised last summer.	No. of sheep or lambs sold during year.	No. of fleeces.	Pounds of wool.	Value of poultry marketed.	Value of eggs marketed.	Bushels of apples.	Barrels of cider made.	Bushels of peaches sold.	Value of peaches sold.	Bushels of pears sold.	Value of pears sold.	Bushels dried apples.	Bushels of dried peaches.	Value of other fruit.	Value of grapes.	No. gallons wine made. What kind.	

Town of / School District No. / NAMES OF THE PRODUCERS.	FRUIT TREES PLANTED.					DRAINAGE.		BUILDINGS.				HORSES.				REMARKS.
	No. apple trees on farm.	No. pear trees on farm.	No. peach trees on farm.	No. cherry trees on farm.	No. grapevines in vineyard.	Rods tile drain.	Rods stone drain.	Rods board drain.	Rods open ditch.	No. houses built this year.	Value houses built this year.	No. barns built this year.	Value barns built this year.	No. colts raised.	No. horses on hand.	No. horses sold.	Value horses sold.	

Importance of Securing Statistics.

The importance of securing the agricultural statistics of our State at more frequent periods than ten years, we believe is admitted by all who have had their attention turned to the subject. The benefits which would accrue from an annual collection of the statistics, would prove of immense advantage to all of our great interests, agricultural, commercial and manufacturing. The Legislature of this State, appreciating the importance of obtaining an annual collection of statistics, in 1862 passed the act for the collection of agricultural statistics.

It was made the duty of the Comptroller to provide blanks by the first day of December, of such form and containing such questions as shall be approved by the Executive Committee of the New York State Agricultural Society, and furnish the same to the presidents of county, town or horticultural societies, with such instructions as shall enable said officers to discharge the duties required of them, as contemplated by the act.

The Executive Committee of the State Agricultural Society prepared forms and questions, which were approved by the Comptroller, and the necessary blanks were provided, but owing to the great amount of business on hand, the public printers were not able to have all the blanks ready so as to be distributed until about the first of January.

As there were no spare clerks in the Comptroller's department, the labor of distributing the blanks was assumed and performed at the State Agricultural Rooms for the Comptroller, and all the requirements of the law complied with at as early a day as practicable after the blanks were received.

There being no societies in six of the counties of this State to attend to the statistics, the Executive Committee of the State Agricultural Society appointed persons in five of the counties, as provided by the seventh section of the act. In the remaining county they were unable to secure a proper person to superintend the work, and only four of those appointed have made their reports.

The number of counties from which returns in whole or in part have been received by the Secretary of the State Agricultural Society, to whom they were to be made as provided in section two of the act, is twenty two. Of these returns, the number in which each school district in the county made returns was three, and in thirteen counties a large majority of the districts have made returns.

The principal reasons given for not making more perfect returns, were want of time and insufficiency of compensation; the law providing that where the persons in the school districts perform their duties, they should each receive one copy of the Transactions and one of the Institute published for the year when the statistics were collected.

In connection with the statistics returned, are suggestions in several cases as to an alteration in the law and also in the blanks, for collecting the statistics, which are valuable, and which will be presented to the Executive Committee for consideration, and their decision as to future blanks will be submitted to the Comptroller; and should alterations in the law be required, the next Legislature will doubtless make such alterations as may be deemed advisable.

It is suggested by some of those engaged in taking the statistics, that

if the duties were devolved upon the assessors of each town, that they, in common with the officers of agricultural societies, would more earnestly and promptly secure the returns required.

The State of Ohio has for several years, through the assessors, collected the agricultural statistics of that State, and the system adopted there has operated well, and it is believed entirely satisfactory to the people. This is probably the least expensive and most reliable method of securing the statistics.

The returns which have been received, except in a few counties, fail to comply with the law. The presidents of agricultural societies were required to add up the returns and the aggregate result for each school district, in such manner as to show the result in each town by school districts; and these results were to be forwarded to the Secretary of the State Agricultural Society. Instead of this, the blanks filled up in the school districts have been sent without *being added up*, and a labor, altogether unexpected, has in consequence been imposed, and has rendered it impracticable to do justice to the returns which have been received. The returns first received were from the county of Steuben, every one of the school districts and parts of districts complete, added up and ready to be transferred at the Agricultural rooms on their reception. And the counties of Cayuga and Tompkins were also received complete; and had all the counties discharged their duties in like manner, the work could have been completed in a very short time, and would have been far more correct than it now is.

It has been deemed advisable to submit the returns as they have been made. They are sufficient to show the importance of the work, and that it can be done through the agricultural societies if the necessary blanks are prepared and distributed at an early day.

AGRICULTURAL STATISTICS.

Counties.	GRASS LANDS.				SP'NG WHEAT.		WINTER WHEAT.			OATS.		RYE.		BARLEY.		BUCKWHEAT.		CORN.			
	Acres of pasture.	Acres of meadow.	Tons of hay.	Bushels of grass seed.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres sown last fall and now on gr'd.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres sown.	Bushels harvested.	Acres planted.	Bushels harvested.	Acres broom corn.	Lbs. broom corn.
Albany	19,083	29,663	36,949	1,097	532	4,073	46	679	181	10,048	173,315	2,902	33,114	504	8,989	5,341	57,423	2,314	58,470	16	1,840
Broome	12,093	8,990	11,603	230	250	1,990	735	7,676	678	2,154	71,154	498	4,927	15	257	897	13,554	1,359	40,336	21	9,664
Cayuga	87,180	66,720	70,380	19,520	9,060	120,540	33,700	688,200	28,920	42,100	966,140	1,920	100,560	20,040	429,060	5,780	112,480	28,920	948,820	140	56,000
Chemung .	32,605	23,237	28,515	2,318	4,256	33,272	3,885	47,731	3,973	16,296	409,396	1,113	10,929	2,067	47,135	6,168	68,898	4,313	138,510	248	9,599
Chenango .	165,864	117,319	130,580	1,208	1,198	12,580	768	8,270	675	19,856	547,948	1,429	13,338	843	9,110	2,990	38,540	7,661	206,660	32	590
Clinton	47,072	36,501	25,408	1,013	8,789	69,712	53	429	45	14,815	278,362	1,188	9,063	1,739	29,610	5,145	65,391	2,970	44,110	181	150
Fulton	48,845	37,597	36,969	347	574	5,288	138	1,867	233	11,230	292,395	1,892	17,372	674	12,282	3,901	43,974	4,782	63,297	½	1,350
Greene	82,959	100,508	122,200	2,728	1,976	14,725	530	5,959	1,231	17,360	396,246	130,451	19,873	322	5,961	9,144	118,135	1,452	287,214	867	30
Niagara	18,029	15,252	14,637	5,438	7,385	76,849	13,020	243,088	15,161	6,228	191,763	192	2,515	267	5,764	672	8,119	6,833	257,969	3	1,180
Oneida	92,762	63,212	72,112	837	848	7,518	2,340	37,168	2,126	17,189	470,658	1,294	14,103	1,606	36,588	1,629	18,485	8,663	215,628	37	9,745
Onondaga .	79,073	61,877	80,597	11,187	10,970	97,605	23,471	367,427	30,081	35,376	913,325	813	8,424	6,028	126,583	3,499	51,463	19,940	676,033	55	24,180
Otsego	56,750	42,532	54,348	1,054	1,037	10,480	554	6,127	383	12,452	303,750	507	5,464	768	15,794	1,766	27,599	2,812	75,580	10	.....
Queens	11,962	25,914	34,992	921	115	1,109	5,718	97,011	5,488	6,207	149,597	4,029	48,073	84	1,973	2,172	29,252	10,308	347,336	½	890
Saratoga ..	67,441	50,416	57,264	1,282	1,674	9,778	820	13,469	1,273	20,507	492,605	12,126	91,086	348	6,139	7,867	84,423	15,415	485,823	584	10,131
Schenec'y .	15,987	15,983	19,116	1,235	464	3,960	96	1,757	173	7,915	176,947	1,536	20,969	936	15,725	2,939	27,321	2,324	48,903	783	315,603
Schuyler ..	20,964	21,384	23,285	8,025	9,013	83,979	4,925	78,378	6,435	10,453	268,887	646	7,485	2,823	57,907	3,966	68,146	3,605	175,203	241	136
Steuben ...	125,783	85,777	88,989	5,087	38,805	363,857	19,403	200,699	7,739	48,499	1,104,371	2,355	23,140	7,567	128,763	14,929	145,115	8,688	237,532	30	10,737
Suffolk	30,108	25,215	32,959	1,276	143	1,288	10,517	212,656	8,040	8,388	338,639	5,331	34,847	721	16,111	909	13,502	13,232	604,650	52	600
Sullivan ..	39,309	41,230	41,667	2,108	622	6,177	134	1,679	377	5,754	97,222	6,978	70,906	38	437	7,737	73,181	3,473	91,592	44	926
Tompkins .	50,760	43,420	58,836	9,573	10,005	88,136	7,562	124,410	9,181	23,225	702,978	2,604	34,668	4,498	100,576	8,109	123,863	11,728	557,749	21	14,750
Warren	52,579	37,019	30,790	1,615	1,386	106,044	262	2,084	389	6,948	104,758	4,023	24,152	9	268	4,924	47,616	6,932	122,381	....	.....
Rensselaer	8,553	7,382	7,403	671	174	1,742	250	171	104	2,729	82,963	2,263	22,129	111	2,032	702	9,990	1,668	43,195	½	.....

AGRICULTURAL STATISTICS—Continued.

COUNTIES.	POTATOES.			PEAS.		BEANS.		ROOT CROP.				FLAX.			TOBACCO.		HOPS.		BEES.		
	Acres planted.	Bushels harvested.	Any rot.	Acres sown.	Bushels harvested.	Acres planted.	Bushels harvested.	Acres sown.	Bush. turnips harvested.	Bushels beets harvested.	Bush. carrots harvested.	Acres sown.	Pounds lint or straw.	Bushels seed.	Acres planted.	Pounds harvested.	Acres planted.	Pounds raised.	No. hives.	Pounds honey.	Pounds wax.
Albany	985	94,779	1,551	871	12,621	127	782	52	5,315	3,830	15,049	38	3,568	163	1-8	111	22	4,981	2,659	24,365	1,021
Broome	464	47,025	490	16	296	10	235	26	3,870	284	2,298	4	1,682	16	1	2,534	10	7,750	620	8,105	191
Cayuga	2,280	270,020	¼ crop	90	2,100	300	7,780	820	4,560	18,400	51,000	17	1,120	160	3½	3,300	10	1,120	11,240	48,860	3,760
Chemung	1,260	104,023	2,880	179	1,520	124	1,247	84	5,012	5,295	4,688	15	3,922	61	199	203,556	4	2,037	3,215	42,093	1,542
Chenango	3,317	325,445	5,586	294	5,416	103	1,803	160	36,061	5,489	17,095	48	21,709	243	10	7,792	505	399,173	5,076	36,876	2,482
Clinton	10,057	436,193	20,375	1,530	16,814	927	10,792	200	23,681	2,513	7,201	29	31,596	52	9	398	1	860	2,706	37,181	1,781
Fulton	2,479	204,265	4,232	702	13,639	80	1,368	57	9,139	2,260	11,290	250	269,511	1,432	.....	.....	159	91,965	2,260	21,968	922
Greene	4,287	291,694	9,781	581	7,318	172	3,235	186	25,379	2,836	30,783	49	9,350	201	110	315	46	38,177	8,199	50,250	2,265
Nia ara	1,102	108,473	4,321	2,165	39,150	877	9,871	84	15,996	3,115	13,405	74	94,050	681	½	692	.....	15	2,073	11,996	477
Oneida	4,040	461,898	.....	778	15,135	280	4,961	115	30,344	6,904	20,171	235	109,143	2,295	23½	21,059	455	479,380	3,613	29,398	1,365
Onondaga	5,472	564,918	78,717	5,472	111,073	1018	11,519	258	43,478	15,647	35,078	1623	152,180	3,325	1,289	2,288,105	74	46,538	7,086	56,196	2,344
Otsego	1,494	170,827	4,246	544	11,659	39	599	83	16,036	5,380	18,494	19	8,400	124	4 2-4	1,049	2,503	2,594,229	2,438	22,474	1,192
Queens	3,531	324,314	3,578	546	64,318	278	30,430	950	139,748	22,760	83,872	....	.....	.....	1½	1,820	.....	85	1,381	6,102	306
Rensselaer	2,447	229,499	282	9½	195	224	694	15	1,281	659	2,222	772	135,944	3,783	.....	16	.....	.....	536	5,969	153
Saratoga	8,639	705,969	2,060	956	13,904	299	2,572	1,137	34,134	6,142	21,370	216	113,790	7,002	2½	2,456	112	46,663	5,547	47,129	4,661
Schenectady	1,075	104,725	775	726	10,017	37	506	168	3,337	1,291	4,647	438	351,715	2,647	.....	.....	49	35,803	1,424	10,593	1,287
Schuyler	612	79,954	1,909	146	5,355	124	1,735	17	1,762	501	5,843	348	200,175	3,276	35	60,937	3	16	3,475	40,987	1,204
Steuben	53,720	500,832	6,071	3,359	52,705	531	9,679	677	56,258	11,256	15,481	83	24,314	669	16	23,161	41	13,270	12,912	158,815	7,340
Suffolk	4,439	489,720	517	1	218	50	1,317	441	111,745	3,855	57,787	....	.....	.....	.....	.....	.....	20	1,074	3,621	373
Sullivan	1,925	127,762	9,975	22	309	34	691	214	30,993	1,120	3,476	9	5,737	39	2	610	.....	459	3,946	45,737	2,229
Tompkins	1,979	204,765	5,686	369	6,033	371	4,952	104	9,533	2,228	9,450	412	288,135	3,702	79	184,950	5	1,936	7,426	73,577	3,548
Warren	4,050	267,043	1,729	307	5,288	151	2,041	540	35,382	1,258	7,064	4	522	19	½	200	.....	182	2,266	25,585	1,074

AGRICULTURAL STATISTICS.—Continued.

COUNTIES.	NEAT CATTLE.					BEEF.		DAIRY.					BARN-YARD MANURE.	SWINE.			
	No. oxen.	No. cows.	Other cattle besides calves.	Calves raised.	No. cattle lost by disease.	No. of beef cattle sold.	No. beef cattle slaughtered.	No. cows milked for butter.	No. pounds of butter.	No. cows m'l'd for cheese or sale of milk.	No. pounds of cheese or gallons of milk sold.	Value of market produce garden.	How many loads barn-yard manure made on the farm.	No. of hogs raised.	No. of hogs sold alive.	No. hogs fat'd and killed.	Pounds of pork killed.
Albany	657	4,114	1,309	974	63	493	263	3,887	397,876	221	11,158	4,780	82,329	8,568	1,174	4,650	786,752
Broome	409	8,267	1,600	1,152	80	336	285	3,074	383,076	50	22,400	7,770	25,839	1,964	534	1,592	350,734
Cayuga	480	13,000	8,380	4,960	320	3,380	1,620	12,980	1,327,160	1,380	251,720	945,960	499,900	27,500	18,140	209,000	4,720,260
Chemung	1,275	8,436	5,495	3,506	288	1,815	891	7,304	781,430	2,068	122,360	6,111	94,101	6,304	1,653	7,513	1,075,768
Chenango	2,358	43,319	15,036	12,194	930	6,939	6,649	36,831	4,961,901	5,510	1,775,456	10,428	281,710	15,170	5,317	11,792	2,924,884
Clinton	1,144	8,682	5,764	4,697	327	2,044	1,156	7,946	636,658	2,488	86,547	10,019	121,065	6,657	1,441	5,212	1,149,911
Fulton	1,237	22,797	4,593	8,739	272	1,320	1,105	7,908	733,400	4,421	1.135.266	617	113,551	7,646	1,932	6,566	1,284,246
Greene	2,649	18,343	7,996	15,949	684	2,899	2,392	17,244	1.891.050	869	88,984	22,460	196,743	17,471	4,914	19,145	3,610,255
Niagara	402	4,646	3,051	1,440	146	1,475	627	4,224	381,121	950	36,521	7,399	125,041	11,626	3,674	7,243	1,590,679
Oneida	1,114	29,666	7,919	6,954	541	4,148	2,826	15,273	1.709.963	13,263	3,963.517	8,872	205,226	12,868	3,869	11,580	2,798,115
Onondaga	1,825	22,961	11,675	7,758	589	7,283	2,300	19,576	2.092.479	3,245	1,492.760	26,508	410,491	29,373	10,762	32,337	4,764,269
Otsego	560	14,512	4,940	4,228	256	2,238	1,693	8,670	945,844	6,714	2,054,058	40,432	132,601	5,738	2,050	4,766	1.036,037
Queens	796	8,257	1,329	1,061	165	981	534	4,849	389,384	2,475	1.537,685	446,646	193,393	11,038	2,802	8,244	1.797,902
Rensselaer	264	1,816	545	533	41	417	166	1,463	137,132	406	98,666	190	29,399	2,156	818	2,605	491,293
Saratoga	2,086	14,890	6,187	4,674	279	2,890	6,675	13,532	1 218,451	1,963	301,177	26,250	218,154	16,352	4,035	15,724	3,136,186
Schenectady	309	3,946	1,915	1,447	105	921	437	3,502	347,645	16,865	81,982	4,724	60,714	4,133	1,049	3,388	611,154
Schuyler	747	4,818	3,828	2,416	138	1,250	1,467	4,303	481,566	141	24,531	1,212	110,387	7,231	2,842	4,283	876,559
Steuben	5,527	26,129	19,365	11,968	664	4,998	4,173	23,298	2.033,893	1,414	409,851	25,774	491,074	25,886	6,620	19,966	4,202,516
Suffolk	696	10,280	5,560	3,862	172	2,300	1,866	6,800	574,798	141	69,580	6,645	296,706	12,345	2,894	14,157	3.132,005
Sullivan	4,240	10,024	7,403	5,622	485	1,625	1,474	10,411	959,324	9,203	110,424	5,667	91,364	7,047	2,133	6,288	1·207,422
Tompkins	1,664	15,394	9,246	5,985	341	2,705	1,941	14,843	1,989.225	391	56,886	107,631	203,670	15,289	5,917	10,162	2,394,195
Warren	1,957	8,023	5,812	3,839	225	2,039	1,609	7,726	611,008	3,901	51,661	6,198	79,398	6,228	2,328	4,753	925,286

AGRICULTURAL STATISTICS.—Continued.

COUNTIES.	SHEEP.						POULTRY.		FRUIT CROP.										
	*No. sheep killed by dogs.	No. sheep wintered last winter.	Number lambs raised last summer.	No. sheep or lambs sold during year.	No. of fleeces.	Pounds of wool.	Value of poultry marketed.	Value of eggs marketed.	Bushels of apples.	Bbls. of cider made.	Bush. peaches sold.	Value peaches sold.	Bushels pears sold.	Value of pears sold.	Bushels dried apples.	Bushels dried peaches.	Value of other fruit.	Value of grapes.	No. gallons of wine made. What kind.
Albany	139	15,799	8,803	8,246	15,029	67,655	5,348	9,893	109,962	2,938	439	515	739	462	1,693	5	1,600	521	590
Broome	49	3,606	2,354	1,690	3,691	13,730	2,207	2,366	28,708	922	158	63	20	17	535	2	449	5	286
Cayuga	420	179,280	53,160	61,340	163,960	769,520	31,617	37,226	578,420	13,620	8,320	4,975	4,720	6,061	29,720	2,680	9,142	18,520	51,580
Chemung	228	16,560	8,310	8,603	15,583	56,161	5,431	5,153	103,428	3,179	1,195	1,399	145	306	2,284	120	1,702	363	420
Chenango	398	52,216	23,203	23,694	50,298	195,302	6,822	12,946	528,102	10,882	16	35	545	417	10,321	12	1,903	431	9,789
Clinton	460	24,658	12,535	8,893	23,983	92,370	7,553	4,620	55,304	1,100	20	.....	127	141	3,379	31	2,703	431	1,098
Fulton	94	14,383	8,533	6,423	14,185	57,802	4,557	4,821	102,475	2,832	10	20	150	157	1,215	.....	56	20	277
Greene	399	29,311	17,635	20,427	27,823	117,668	16,540	24,474	548,947	15,543	6,995	7,521	7,853	7,659	6,993	1,224	15,527	6,763	5,167
Niagara	192	36,499	15,277	11,643	35,709	150,677	5,611	5,179	220,006	5,287	16,444	12,588	1,268	2,089	5,371	1,501	2,888	7,789	6,321
Oneida	255	17,186	11,542	10,249	14,172	64,863	9,523	17,538	378,417	10,449	16	13	.....	1,054	3,592	1	2,099	394	1,614
Onondaga	578	94,447	44,172	37,055	91,305	460,891	18,934	27,514	603,323	19,794	1,675	1,445	1,729	2,747	6,539	191	2,220	9,031	4,083
Otsego	128	24,296	13,544	12,746	23,538	93,833	3,427	7,130	307,576	6,613	5	1¼	262	276	3,566	1½	291	16	722
Queens	94	2,371	2,180	2,019	8,861	7,008	52,311	32,364	120,424	3,906	433	224	10,938	6,557	238	113	7,109	1,677	3,323
Rensselaer	52	8,090	3,787	2,973	7,159	29,242	2,284	1,994	45,055	1,863	3	.....	470	396	241	3½	116	79	611
Saratoga	382	36,609	19,853	21,339	36,579	145,836	17,580	26,401	723,650	11,626	45	96	1,061	2,013	3,004	723	5,604	2,496	2,165
Schenectady	27	5,796	4,581	4,052	5,541	2,285	4,673	7,100	70,665	2,308	1	92	80	138	873	2	825	257	325
Schuyler	208	42,497	14,606	25,130	36,151	160,425	5,312	10,058	166,775	4,441	4,049	4,096	486	503	5,842	555	3,713	917	678
Steuben	446	170,616	65,280	31,000	166,891	631,316	15,046	22,104	484,664	10,664	1,488	1,181	365	389	15,282	427	8,467	11,775	16,345
Suffolk	212	12,451	7,727	6,244	9,502	26,940	35,460	28,528	61,420	6,230	2,756	3,804	645	2,670	225	219	2,336	1,178	1,089
Sullivan	269	10,392	6,916	4,517	9,645	34,609	4,321	3,467	150,077	3,488	492	552	458	371	2,616	43	1,096	74	998
Tompkins	209	42,655	47,639	19,665	45,752	183,648	17,907	19,745	445,497	9,475	4,184	3,007	1,948	1,569	16,782	545	3,966	2,548	1,998
Warren	264	19,487	10,906	10,423	19,217	79,624	7,012	8,311	116,166	18,417	6	3	129	122	3,584	2	1,710	307	219

* Number killed, 5,390.

AGRICULTURAL STATISTICS.—Continued.

COUNTIES.	FRUIT TREES PLANTED.					DRAINAGE.				BUILDINGS.				HORSES.			
	No. apple trees on farm.	No. pear trees on farm.	No. peach trees on farm.	No. cherry trees on farm.	No. grape vines in vineyard.	Rods tile drain.	Rods of stone drain.	Rods board drain.	Rods open ditch.	Number houses built this year.	Value of houses built this year.	Number barns built this year.	Value of barns built this year.	No. colts raised.	No. horses on hand.	No. horses sold.	Value of horses sold.
Albany	93,615	5,690	2,881	3,199	1,041	3,526	11,623	86	27,533	27	13,220	30	5,930	206	1,734	250	19,206
Broome	27,405	1,872	1,117	2,600	445	33	2,024	370	4,817	24	5,162	39	5,065	106	1,013	121	7,834
Cayuga	685,580	175,960	68,060	44,220	139,740	830,060	1,313,920	1,200	549,880	140	54,500	200	33,300	1,280	14,180	1,160	72,370
Chemung	84,601	5,673	10,666	7,776	10,676	1,837	13,884	2,389	12,374	72	47,819	80	13,322	455	3,728	430	36,952
Chenango	306,955	10,523	696	21,572	1,738	411	11,436	959	40,583	172	50,917	228	23,785	941	9,899	1,434	108,064
Clinton	73,863	1,370	38	4,663	1,122	1,577	7,797	1,614	73,770	197	29,415	113	11,787	661	5,574	715	59,062
Fulton	83,064	2,134	23	594	476	1,295	16,646	515	20,205	33	29,750	51	9,839	397	4,123	403	31,177
Greene	325,786	64,993	31,870	34,470	25,980	3,142	51,591	3,057	100,829	166	60,371	157	36,899	611	8,963	1,405	118,157
Niagara	208,620	32,782	69,252	13,583	70,447	6,430	5,136	262	96,212	56	41,850	46	10,044	394	4,701	486	38,541
Oneida	174,790	9,802	368	4,123	6,697	16,183	56,817	5,748	61,466	121	62,764	129	27,900	723	7,763	917	71,571
Onondaga	304,843	27,161	13,649	38,489	35,097	65,028	207,868	11,638	100,358	273	92,377	209	48,997	1,199	14,043	1,655	192,691
Otsego	123,208	2,922	87	2,210	413	2,523	12,837	1,112	19,106	54	26,256	63	12,410	386	4,942	558	41,221
Queens	83,189	36,450	12,119	21,673	7,528	1,545	1,873	499	4,635	79	79,822	60	26,690	269	5,423	466	38,380
Rensselaer	21,647	1,710	97	2,636	532	1,843	6,162	86	11,173	15	13,050	17	5,145	69	1,094	74	7,639
Saratoga	160,467	9,616	1,217	14,575	6,808	23,753	57,621	4,796	95,991	268	50,108	109	22,732	803	7,536	679	86,882
Schenectady	48,760	1,832	94	1,480	490	257	10,308	476	16,308	30	11,750	18	5,740	191	436	219	22,343
Schuyler	77,424	5,904	28,848	12,317	10,655	3,771	73,880	623	11,311	37	17,865	42	7,369	361	3,811	360	27,774
Steuben	361,431	16,588	20,145	39,145	82,918	1,647	44,278	438	27,620	198	56,548	241	38,550	1,775	16,360	1,231	110,932
Suffolk	47,322	32,039	17,480	10,386	8,501	.....	.....	.....	2,320	23	32,560	27	9,400	128	6,040	624	43,810
Sullivan	138,364	4,789	5,752	8,934	877	181	6,414	162	12,125	124	32,248	158	18,093	349	3,255	518	33,759
Tompkins	157,382	23,055	23,628	27,449	9,890	4,527	103,298	3,519	13,047	87	38,535	100	28,865	838	8,297	904	67,759
Warren	97,741	629	149	6,088	1,405	21	9,729	341	11,378	75	36,407	65	9,515	450	3,943	766	56,385

From the statement of the statistics of Cayuga county, 1862, as taken under the direction of S. Edwards Todd, secretary county agricultural society, and returned complete; also from Steuben county, containing returns from every district, taken under direction of Hon. Goldsmith Denniston, president county agricultural society, we have made a comparison with the census of the United States, 1860, as far as they agree in the articles entered, and have added the divisions in which articles not taken under the United States census are given. This will show the state of these counties as compared with 1860, and also the present state, as given by the statistics, as taken under the law of 1862.

Had the returns been completed we should have made the comparison in all the counties with the census of 1860. Considering the embarrassments under which the statistics have been collected, the returns are much fuller than we anticipated.

We have secured, for the first time, the number of sheep killed by dogs —5,503 sheep in twenty-two counties as reported, and from the remaining districts in those counties not returned would have increased the number to at least 8,000, and for the whole State probably 50,000; valued at present prices for sheep would make for the whole State at least $175,000. We ask of the farmers of the State if they can afford to supply with choice mutton sheep these worthless curs roving over their fields every year. Let us have another year a complete return from every county in our State, in which all our products of industry shall be fully obtained, from which we may be enabled to make estimates which shall be of great advantage to the agricultural, commercial and manufacturing interests of our State. This can be secured at a very moderate expense, and will secure advantages vastly more important than the cost, and where a system is once properly arranged, it can be done with comparatively little labor.

In the blanks prepared a new column was inserted, giving the number of acres of winter wheat sowed in fall of 1862, and which comprises the crop harvested in 1863. From the returns made it appears that the number of acres sowed exceeded the number harvested in 1862 about 24,000 acres, showing the gradual return to wheat culture, and if the remaining counties, which include most of our wheat growing counties, should advance in the like proportion, the wheat crop will be much larger than for several years past.

Owing to the defective returns made, an amount of labor totally unexpected and unprovided for has been imposed upon the Agricultural Society. By severe and unremitting labor we have been enabled to supply the printer's demand for copy; and we trust that the deficiencies will be overlooked, as the character of the figures is so various, that undoubtedly mistakes have occurred which might have been avoided had the proper care been taken with the returns.

B. P. J.

CAYUGA COUNTY, INCREASE SINCE 1860.

Horses	40
Sheep	100,889
Swine	1,979
Wheat, bushels	272,870
Rye, bushels	85,149
Corn, bushels	53,356

Barley, bushels	124,456
Buckwheat, bushels	11,027
Wool, pounds	580,562
Wine, gallons	50,818
Market gardens	$931,430
Cheese, pounds	56,215
Hay, tons	5,350
Grass seed, bushels	9,720

DECREASE SINCE 1860.

Working oxen	1,497
Milch cows	5,724
Other cattle	10,849
Oats, bushels	134,848
Potatoes, bushels	161,403
Peas and beans	11,681
Tobacco, pounds	304,603
Butter, pounds	657,329
Flax, pounds	983
Flax seed, bushels	82
Honey, pounds	32,790
Wax, pounds	868

This shows that for two years there has been an increase in horses, sheep, swine, wheat, rye, corn, barley, buckwheat, wool, wine, market gardens, cheese, hay and grass seed, and a decrease in working oxen, milch cows and other cattle, oats, potatoes, peas and beans, tobacco, butter, wax and honey. The amount of tobacco, as given in the United States census, 307,903 lbs., against 3,300 lbs. in 1862; we think there must be a mistake, but it is given as we find it.

In addition to the increase in the articles named, we give those articles not found in the United States census, which, with the other statistics, will show the present condition of the county:

		Value.
Poultry and eggs		$68,883
Apples, bushels	578,420	
Cider, barrels	13,620	
Peaches, bushels	8,320	4,975
Pears, bushels	4,720	6,061
Dried apples, pounds	29,720	
Other fruit		9,142
Grapes		18,520
Wine, gallons	51,580	
Apple trees	685,580	
Pear trees	175,960	
Peach trees	68,060	
Cherry trees	44,220	
Grape vines	139,740	
Drain tile, rods	830,060	
Stone drains, rods	1,313,920	
Board drain, rods	1,200	
Open ditch, rods	549,880	
Houses built	140	54,500
Barns built	200	33,300

We give the returns from Steuben county:

STEUBEN COUNTY, INCREASE SINCE 1860.

Horses	3,020
Oxen	1,645
Cows	4,109
Sheep	35,308
Wool, pounds	189,569
Wheat, bushels	134,898
Corn, bushels	78,730
Butter, pounds	1,945,816

Cheese pounds		178,618
Hay, tons		17,887
Grass seed, bushels		712
Flax, pounds		22,290
Honey, pounds		25,971
Beeswax, pounds		1,916

DECREASE SINCE 1860.

Cattle, other than oxen and cows		2,950
Rye, bushels		64,923
Oats, bushels		89,941
Barley, bushels		150,954
Buckwheat, bushels		171,250
Potatoes, bushels		150,741
Peas and beans, bushels		12,643
Tobacco, pounds		138,496
Flax seed, bushels		731
		Value.
Poultry and eggs		$37,150
Apples, bushels	484,664	
Cider, barrels	10,664	
Peaches, bushels	1,488	1,181
Pears, bushels	865	889
Dried apples, bushels	15,282	
Dried peaches, bushels	427	
Other fruit		8,467
Grapes		11,775
Wine, gallons	16,345	
Apple trees	361,431	
Pear trees	16,588	
Peach trees	20,145	
Cherry trees	39,145	
Grape vines	82,918	
Drain tile, rods	1,647	
Stone drain, rods	44,278	
Board drain, rods	488	
Open ditch, rods	27,260	
Houses built	198	56,548
Barns built	241	88,550

PRESERVATION DECISION
SEE VERSO OF TITLE PAGE